This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

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Industrial Hygiene

—Its Correlation to Industrial Medicine—

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THE industrial practice of medicine consists essentially of two phases, first, the diagnostic and curative aspects of medicine and surgery, and, second, the preventive aspects of the control of unhealthy and unsafe conditions within the plant. The industrial physician, therefore, has a dual role but most frequently devotes his entire time to medicine and surgery. In the field of industrial hygiene, and I am using the term industrial hygiene in its narrowest sense, that is, the control of occupational disease, industrial doctors manifest all degrees of interest from the most complete understanding to the most complete neglect. The medical profession has generally not appreciated the concept that the industrial doctor should logically be the public-health officer of the plant. This is especially true of the general practitioner and on-call physician; and when it is realized that over 85% of our plants are served by these general practitioners or on-call physicians, it can be appreciated that this aspect of industrial medicine has been overlooked. It is unfortunately also true that many full-time plant doctors confine their activities only to physical examinations and the medical and surgical care of workers, paying little or no attention to other phases of industrial medicine. A recent visit to one of the larger Massachusetts plants revealed an up-to-date, well-equipped and truly magnificent medical and surgical layout with three full-time registered nurses. The doctor, a competent surgeon, was completely unaware of the potential lead hazard in this plant and was thoroughly shocked and amazed when it was brought to his attention.

On the other hand, in many of our larger plants the full-time industrial physician knows more about what materials are actually handled than some of the department heads.

The problem of occupational disease is so complex that medical men have permitted this phase of medical practice to slip from their grasp. Since special medical and engineering knowledge is required, industrial hygiene practice has become almost exclusively the special province of engineers. Dr. Clarence Selby, in an address in 1938 before the American Association of Industrial Physicians and Surgeons, said,[1] "Although now admittedly in the field of engineering, industrial hygiene is definitely related to the medical problems of the plant and should be set up as a divisional or sectional activity of the medical department." I think we can all agree, since the physician is the health officer of the plant and responsible for the maintenance of employee health generally, that the functions of industrial hygiene should be directly under his control.

THE problems of occupational disease, however, are truly complex, and the changes that are taking place are many. Alertness is necessary to keep abreast of the many new chemicals and changes in processes which develop naturally in industry. The war has accelerated some of these, and many of them are only wartime expedients, but this is not entirely true, as many of the changes and substitutions are proving to be better than the originals.

The development of synthetic rubber has led to the widespread use of known toxic solvents and the introduction of many whose toxicity or lack of toxicity is being proved by actual industrial trial. In many instances there has been insufficient time to evaluate their toxicity experimentally before introducing them into industry. Among such solvents may be mentioned butanol, where industrial experience has demonstrated that it is extremely irritating to the eyes, and relatively low concentrations give rise to a non-specific form of conjunctivitis. Methyl ethyl ketone, a substance with an unpleasant odor, has been used extensively, and, while not very toxic, has nevertheless necessitated the use of power ventilation to control its nauseating effect. The use of certain synthetic rubbers, especially neoprene, necessitates a suitable solvent. The use of chlorinated hydrocarbons such as carbon tetrachloride, ethylene dichloride and trichlorethylene has increased, since these are most satisfactory for this purpose. Of the three, trichlorethylene is the least toxic but nevertheless capable of producing symptoms of headache and dizziness. Trichlorethylene has been advocated as a substitute for the more toxic chlorinated hydrocarbons such as carbon tetrachloride, but there is an unjustified complacency about its use. A

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recent report in the literature has disclosed 11 cases in the last six years with several deaths.[2] Carbon tetrachloride has long been known to be a systemic poison which can cause liver and kidney damage, and recent investigations have shown that rather low concentrations in the neighborhood of 50 p.p.m. may induce symptoms. Ethylene dichloride, a substance not so well known, is apparently of the same order of toxicity as carbon tetrachloride with a similar effect on the body and, in addition, has proved to be a rather strong irritant of the eyes.

The growth of plastics manufacturing is one of the phenomena of modern industry. The dermatitis hazard associated with the use of formaldehyde resins is well known, but in a number of these plastics other substances may be the cause of occupational disease. For instance, a plastic with which we have had a great deal of experience contains as one ingredient lead borate powder, and the manufacture of this substance has occasioned a severe lead hazard. Fortunately, the finished plastics do not present any special hazard except that of a dermatitis. However, the intermediate stages of their manufacture present a constant challenge to the industrial physician in controlling their skin and systemic effects.

The scarcity of certain metals has resulted in substitution wherever possible for those metals whose stock piles have not been sufficient for the conduct of the war. Lead has fortunately been abundant and has been used as a substitute in many instances. Many of the solders now contain a much higher proportion of lead; and under certain conditions, especially where a higher temperature is used than is necessary to keep the solder molten, lead fumes may be given off into the atmosphere. In some instances, we have found solders to consist of 99% lead. Silver solder with a percentage of cadmium has occasioned a hazard, and deaths have been reported from the inhalation of cadmium fumes. Inhalation of these fumes may lead to a severe bronchitis and pulmonary edema. Yellow brasses are poured more often now than the red brasses, that is, these brasses contain more zinc and less copper, and cases of metal fume fever have occurred in foundries where the zinc chills were unknown before. The use of aluminum has increased, and, while this metal has no special toxicity, the use of fluorides in the fluxes of welding rods where aluminum is employed has created the hazard of fluoride poisoning. A hazard also exists in the smelting of aluminum from cryolite, since fluorine is the next most common constituent in this raw material.

Chlorinated naphthalenes and diphenyls, that group of substances which make up the chloro waxes for the insulating of cable and condensers, have been responsible for a number of deaths throughout the country. The dermatitis which this material induces is rather characteristic, but less well known are the systemic effects. In all cases reported in humans, deaths have occurred on exposure to fumes of the heated material, but there is good experimental evidence that individuals with dermatitis from this material may develop liver damage. That clinically few, if any, chloracne cases develop liver damage is probably due to the fact that workers are rotated from these jobs or quit when the acne develops, and hence do not progress to the stage of systemic poisoning.

Welding has created a great deal of interest with the adoption of this method of joining metals as the basic one in the shipbuilding industry. The hazards have been reviewed repeatedly, namely, those of carbon monoxide, toxic materials in the rod coating such as fluorides, the oxides of nitrogen which may be evolved, and the liberation into the atmosphere of the metals which are being welded or which have coated the welded materials; but still more clinical data based on case observation are required to determine whether or not welding may cause permanent sequelae. It is generally accepted that except in specific welding operations, the occupation generally is non-hazardous, but more clinical data are necessary to define exactly which working conditions may prove harmful to the worker.

The cleaning and coating of metals have always occasioned hazardous exposure to the toxic materials in industry. For a long time caustics have been used to clean metals, but lately, with the necessity for increased precision and the decrease in the tolerance permitted, careful cleaning of parts has demanded the use of other solvents. Naphtha is used extensively but, since it creates a fire hazard, carbon tetrachloride has been somewhat popular. Lately, the swing has been toward the use of trichlorethylene. In some instances, steel shot has been found to be too coarse for the proper cleansing of castings, and we have noted in a number of cases that sand is again used for this operation. The coating of metals constantly requires alertness on the part of the industrial hygienist, as the solvents for the new synthetic resins and lacquers are constantly undergoing change and improvement. The technologist creating these materials is primarily concerned with their industrial qualities and not with their toxic qualities. New metallurgical techniques, such as the use of powder metallurgy, have caused certain changes in the hardening of steel. A serious carbon monoxide hazard is present when a reducing atmosphere of carbon monoxide is used in the brazing of metals. Common salt has given way to the use of lead and cyanide baths for the case hardening of steel, and both these techniques require study to obviate any hazard from these two known poisons.

I HAVE NOT even begun to detail the many changes and hence the constantly new problems which are created in industrial hygiene. The recognition of these and the handling of them is so varied and specialized that it is obvious that only a few people would be competent to take care of them. In any given plant, however, the number of hazards must necessarily be limited, and the plant doctor should be able to guide the development of any program for the control of these occupational exposures. It is obvious that the engineering and chemical help must be forthcoming to make any program effective. In some of the larger industrial plants, industrial hygienists will be employed under the supervision of the medical director, but in the smaller plant, and especially in those plants serviced by part-time and on-call physicians, probably no member of the plant personnel will be able to handle all phases of these problems. The plant physician must therefore call upon other individuals to assist him in an effective program.

There are a number of consulting hygienists who devote their entire time to the study and control of the problems outlined above. Insurance companies almost without exception maintain an engineering department whose activities, while mainly concerned with accident prevention, include control of these occupational hazards. In addition, there are the state and Federal agencies whose function is to aid all industry in just these problems. The Division of Industrial Hygiene of the U. S. Public Health Service is such an agency but concerns itself at the present time chiefly in a consultative capacity to the more complex and investigative problems which have a direct or an in-

direct bearing on industrial hygiene as related to this war. The division of industrial hygiene in this state, called the Division of Occupational Hygiene, is organized under the Department of Labor and Industries where its functions began and in so far as occupational-disease prevention is concerned may be considered to belong. At the present time the technical personnel of the Division of Occupational Hygiene consists of a director, a physician, two engineers and five chemists. Since there are over 10,000 manufacturing establishments in Massachusetts, it is manifestly impossible for this small number of people to provide service to all industry adequately; and, while overworked, this Division can and does do an adequate job in taking care of specific occupational-disease problems as they exist and as they arise within this Commonwealth. The services of this Division are available to any and all industrial establishments. Many industrial physicians have availed themselves of the services offered by this Department. The functions of the individual members of this Division when integrated present a complete industrial hygiene unit.

The function of the director is the over-all administration of the division. He coordinates its manifold activities and directs the numerous conferences with employers, industrial doctors and nurses, public health workers and others. He stimulates and guides research and supervises the work of the technical personnel.

The function of the physician is to render medical aid and consultation to industry. In this connection he works closely with their medical departments and initiates medical services in those plants which do not already have such services. He also consults on the diagnosis and treatment of occupational diseases, and in many instances helps to determine if any given exposure is capable of producing illness. Advice on personal protective devices and other recommendations regarding personal hygiene in the prevention of occupational disease are part of his duties. The physician is also directly concerned with any public-health program in industry, and consults on a number of miscellaneous matters regarding the relationship of medicine and industry.

SINCE industrial poisons enter the body chiefly through the respiratory tract, contamination of the atmosphere with industrial toxins is extremely important. Threshold values have been established regarding the maximum allowable concentrations of most of the common toxins. It is the function of the chemist to sample the air for both the presence and quantitative amount of these substances in the breathing zone of the worker and thus determine the degree of exposure in any given manufacturing process. Since most poisons are excreted in the urine totally or in part, he also analyzes for the presence and amount of these toxins or their end products; and since standards have been set regarding the normal amount of the substance excreted, the degree of hazard may be judged in this manner. Another function of the chemist is the analysis of potentially harmful chemicals for the degree and type of toxicity they may induce. Since many industrial poisons are also important in the realm of toxicology, there is great parallelism between the work of an industrial hygiene chemist and the toxicologist.

The most common method of controlling occupational disease is through the use of local or general exhaust ventilation. This particular sphere is the work of the industrial hygiene engineer who designs suitable exhaust systems if a concentration of any dust, fume or gas is above the maximum allowable limit.

It is hoped that the cooperation of this unit with industrial physicians will be expanded as doctors in industry learn of the many advantages to be gained by calling upon the division of the state government whose function is entirely advisory.

References

1. SELBY, C. D.: The Physician's Responsibility in Industrial Hygiene. Presented before AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Chicago, June 6, 1938. *Industrial Medicine*, August, 1938, p. 520.

2. QUADLAND, H. P.: Petroleum Solvents and Trichlorethylene. *Industrial Medicine*, January, 1944, pp. 45-50.

Observations on Skin Diseases

—Industrial and Otherwise—

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DESPITE the numerous papers that have been written about the industrial dermatoses, many rashes are still occurring among our workers. All of these are not preventable, yet many could be avoided by a little care on the part of the employer, the employee, and the plant physician or nurse. It is probable that the employer should take the lead in any dermatosis-prevention program, for he is the one who usually knows the chemicals which the worker is handling, and so he is in a position to acquaint himself with their chemical and irritant action on the skin. The state, the various insurance carriers, and a few independent experts offer valuable consultation service to those with an industrial dermatitis problem. More plant owners should take advantage of this service.

The examination and treatment of industrial cases comprise between 25 and 30% of a dermatologist's practice — and the percentage is increasing every month. There are two things that impress one while examining such cases, first, the incidence of skin rashes which could be entirely prevented, and, second, the number of everyday, non-industrial dermatoses which workers would like to attribute to their occupation.

It will probably surprise you to learn that, in my experience, the greatest number of unnecessary skin rashes (and incidentally the ones which cause the greatest number of lost days) are those dermatoses that are secondary to the use of the sulfonamide ointments. So common are these that when plant directors and physicians seek advice, their use in the plant is deprecated. The idea that no laceration, skin wound or infection will heal without the use of a sulfonamide ointment or powder has not the least foundation in fact. Yet many firmly believe that the sulfonamides are necessary for the treatment of such conditions. Prior to their introduction into medicine, the skin of workers suffering with lacerations, contusions, and infections healed very nicely following washing the part with soap and water, and the application of a sterile dressing. If the physician or nurse preferred, a dilute non-irritating watery or alcoholic solution of an antiseptic was used under the sterile dressing. Such simple therapy gave excellent results in the majority of cases. Today, the use of one of the newer wetting agents of the alkyl dimethyl benzyl ammonium chloride[1] type can be safely recommended to those treating such cases and can, to advantage, displace the use of the sulfonamides.

Approximately 15% of those using sulfonamides become sensitized to them during the first course of therapy. Such sensitization precludes their use at a

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later date when the patient may urgently need them for treatment of a serious medical illness, such as pneumonia or meningitis. That they are unnecessary for skin rashes is proved by the fact that in the past 18 months their use has not been essential despite the great number of varied cases seen in two of Boston's largest clinics or in private practice.

Of interest in this regard is the following:

A 30 year old man was struck on the leg with a heavy, wooden case. The front of his leg was traumatized, and first-aid consisted of washing with soap and water and dressing the part with a 5% sulfathiazole ointment. Within a few days, there was a palm-sized, red, vesicular patch about the contused area. The dressing was changed and more ointment was applied. Within a few days, the rash had involved approximately one-half of the surface of the lower leg. His physician told him he had an "infected leg" and applied more sulfathiazole ointment. When a rash appeared on his trunk and arms, he was referred for consultation. A diagnosis of sulfathiazole eruption was made, and the ointment was stopped. He was given daily Dalibour baths and Dalibour[2] compresses, with immediate improvement. About two weeks after this visit, he asked to have a mole removed from his back. Such is a simple procedure. A few drops of novocaine were infiltrated under the skin, and the lesion was destroyed by cautery. A sterile dressing was fixed in place. Four days later, he reappeared with an acute exacerbation of his original rash. It then occurred to me that novocaine is one of the specific antagonists of the sulfonamides and has a chemical structure quite similar to these agents. This man, then, had been sensitized not only to sulfathiazole, but probably to the entire para-amino benzene group and its derivatives.

If the use of the sulfonamide ointments is completely stopped in plant dispensaries, fewer people will suffer with industrial dermatoses.

OTHER common and unnecessary skin rashes are due to the use of phenol in lotions and ointments. It is a common practice in industrial first-aid offices, to apply calamine lotion or ointment to many itching eruptions. The nurse, doctor, or patient then bandages the part and the patient returns to work.

Within a month, I have seen two severe eruptions of the finger tips from such practice. Phenol when bandaged causes anesthesia of the skin (thus the patient feels no pain), while it works deeper and deeper into the tissues and finally causes gangrene of the part. All competent observers can, in a single glance, recognize the yellowish, thickened, numb finger which follows the bandaging of phenol. One of the points emphasized in all dermatology courses is that phenol should never be bandaged. For safety's sake then, it should not be an ingredient of any of the preparations in the first-aid office.

The various harsh cleansing agents used by the workers are still another cause of serious, yet entirely unnecessary, eruptions. A full hour might easily be devoted to this single phase of industrial dermatology. However, a few words about them must suffice at this time.

The use of cleansing agents such as naphthas, turpentine, thinners, and other solvents can only result in ultimate defatting of the skin, with subsequent redness, cracking, and infection. The addition of sand, or sawdust as abrasives to soaps invariably, mechanically removes the outer, tough, horny layer of skin and thus permits irritating chemicals and bacteria access to the lower moist parts of the skin, where their action is apt to be explosive. The use of caustic soda and other strong alkalis is equally dangerous. Each plant spends many hours in choosing the proper cleansing agent for its finished product. Many rashes might be prevented if the employer would consider maintenance of a healthy skin for the worker a major problem.

The following will illustrate a few of the problems in this regard:

Recently, a worker was seen with a second recurrence of a contact eruption of the hands and forearms. On examination, the hands and forearms were diffusely red, edematous and covered with large blisters. He denied any contact with irritants outside his work and felt positive that his rash was due to his employment (despite the fact that a competent dermatologist in another city had failed by patch tests to find the cause of his eruption on its first occurrence). His work consisted in sealing large cardboard cases with waterglass applied by a brush, and subsequently sealing the flaps with a piece of moistened glued paper. Patch tests with cardboard, waterglass, and glued paper, as well as with a dilute solution of the soap used in the plant, were negative. It then occurred to me that both the waterglass and the soap solution were alkaline in reaction. It is well known that alkalis increase the irritating action of all medications applied to the skin.[3] Accordingly, a dilute mixture of soap and waterglass was applied and a positive patch test obtained. Subsequent questioning of the worker elicited the history that, prior to the onset of the first eruption, he had used a powdered soap mixture as a skin cleanser. While he was absent from work during this first eruption, his department was transferred to a new wing of the building but, owing to the shortage of metal, no soap dispensers had been made available for this wing. He had been forced to use a cake of white soap which he had brought from home. Four days prior to the onset of his second rash, soap-powder dispensers had been installed in the wing and, soon after starting use of the soap, he had noted itching of his skin. This history, obtained subsequent to the positive patch test, strengthened the concept that on both occasions his eruption was due to the combined action of two alkalis on the skin, neither of which alone was sufficient to irritate it. He has been working for some months at the same job and is cleaning his hands with sulfonated castor oil (an acid reacting cleansing preparation). He has had no recurrence of his eruption on this regime.

IT IS surprising how many workers can be kept at work despite the presence of a contact dermatitis, if they will stop the use of harsh soaps, and employ a mixture, as cornmeal and milk, as a cleansing agent. This mixture has been used by many men working with the cutting oils and, after several weeks, they are usually surprised to find that their skin is practically as clean as when they were using harsh soaps and abrasives. Solutions of boric acid or dilute acetic acid may also be used for this purpose.

For various reasons, however, not all rashes are preventable. A recent patient with a severe dermatitis of the hands, face, and forearms was positive that his rash was due to the substance he had used to clean his skin. After hearing his story, none would doubt his word though all might question his wisdom. He stated that a strong alkaline cleanser was kept in large tanks at the plant and was used to remove tar, creosote, rust, oils, dirt, and resins from metal parts. Tar, rust, and resins, he informed me, just "dissolved off the metals." He had used this caustic solution on a rag to cleanse his skin. Would not such a cleanser irritate anyone's skin?

A little common sense on the part of the worker is sometimes sufficient to keep his skin intact.

Speaking of common sense brings the following to mind:

A large company recently inquired as to what type of hat should be supplied to the workers. This request was an outcome of one of the worst rashes seen in recent months, involving the scalp, face, and neck of a woman worker. The parts were red, markedly swollen, and oozing a thin, yellow, secondarily infected fluid. She, at the time of the first visit, was sure that it was due to the hat she had been wearing at work (her local doctor was equally sure that it was due to her work and did not entirely appreciate my opinion that, while she did have a contact eruption many things could have given it to her, and further tests would be necessary before a definite opinion could be formulated). Some four weeks later she was patch-tested with a piece of blue hat which she had worn at the shop, and in 24 hours had a positive patch test. A second patch test some months later, by a dermatologist employed by the insurance company, not only gave a positive patch test, but also resulted in a severe flare-up of her eruption. The initial blue hats had been supplied by the company at no cost to the worker. Damaged hats, however, had to be replaced by the worker. Some of the women had washed the hats only to discover that they faded so badly that new ones had to be purchased. The patient, not wishing to undergo this expense, had not washed her cap.

Further there were no holes for ventilation in the hats. The patient volunteered that the warmth of the unventilated hat caused her scalp to perspire, and that she was accustomed to soak this up by rubbing the cloth against her skin. The sweat dissolved the dye and caused the woman to develop a severe dermatitis. She lost 145 work days, and the insurance carrier has already paid over $750 for this single case—not to mention that so severe was the reaction of her skin that she temporarily lost all her hair—not a pleasant condition for any woman.

It is recommended that white, cotton, vented, washable hats be supplied to the woman workers. Instinctively, women prefer and request fashionable, multicolored creations, yet common sense dictates that simple hats are preferable. Twenty-five per cent of all the industrial cases seen were of the aforementioned, entirely preventable type.

APPROXIMATELY 20% of the cases seen in consultation for industrial establishments were not connected in any manner with the work. Such common diseases, as athlete's foot, herpes zoster, nummular eczema, pityriasis rosea, allergic eczema, pediculosis capitis, impetigo and psoriasis, are some of the conditions that have been frequently seen.

Herpes zoster (shingles) can be recognized by the occurrence of grouped vesicles on a red background distributed along the course of a peripheral nerve.[4] There is usually an associated neuritic pain, and almost invariably some sensory change over the skin innervated by the affected nerve. The cause is unknown and therapy is symptomatic. Workers readily accept this diagnosis when the condition is explained to them.

Scabies, otherwise known as the seven-years' itch, is an infectious disease characterized by the occurrence of small, itching, excoriated papules, vesicles, and burrows which are especially prominent in the folds of the skin (in the finger webs, on the wrists, in the axillae, and in the groin). Itching is severe and is most intense after the patient gets into bed or when the external temperature is elevated. Diagnosis is confirmed by finding the causative mite in the skin lesions. Scabies is a common skin affection and one which should be recognized early in order that other members of a family might not contact it. Treatment is easy though it is frequently incorrectly carried out. Briefly, the routine is that the patient takes a soap and water bath on the first night, and follows this by rubbing a sulfur ointment into the skin of the entire body below the level of the neck. On the second and third days, the sulfur ointment is again rubbed into the skin from the neck down. On the fourth day a soap and water bath is taken and all the clothing and bedclothing are changed, washed and ironed.

Scabies is becoming increasingly prevalent and, when incorrectly treated, causes great periods of lost time in civilian, industrial, and military personnel. A paratrooper was recently seen suffering from scabies and impetigo and gave the story that seven weeks previously the diagnosis of scabies had been made in the camp clinic and that he had been given a jar of sulfur ointment and told to rub it into the parts that itched most. When he was not relieved in a period of seven days, he was admitted to the camp hospital where he stayed for five weeks, again applying several ointments to various local parts of his body. On discharge from the camp hospital, he "loafed" around the camp for a week because his commanding officer sensed that his condition was still contagious. He was given a convalescent furlough of two weeks and immediately on arriving home, was seen in consultation.

Four days were required to cure his scabies completely and a few more days to clear up his impetigo. Here is a man who lost nine weeks from a simple condition which required only a few days of correct treatment to cure. Hospitalization is not necessary for this type of case.

Nummular eczema is a most intractable condition characterized by the occurrence of groups of vesicles in sharply outlined coin-like patches on the outer sides of the arms and legs. Lesions which occur on the hand invariably cause the worker to feel that his eruption is due to his work. The cause is unknown and treatment most disheartening. In all cases search for a focus of infection in the teeth, tonsils, sinuses, etc., should be made.

The other conditions mentioned above are so well known that no word need be said about them—though the hair should be looked at for the presence of nits in all women and girls who present peculiar eruptions on the face or neck.

THERAPY is often difficult in industrial skin diseases but, with proper judgment, good results may be obtained with what seem to be most simple remedies. A review of the treatment ordered in the last 50 industrial cases revealed that the common prescriptions included:

1. Astringent compresses and soaks of such agents as 4% boric acid solution, solution of aluminum acetate (diluted 1 part to 20 with water), and solution of Resorcinol (in 2 to 5%).

2. The second most valuable agents were the cooling and astringent baths, such as starch or dilute acetic acid baths.

3. The third most valuable preparations were the shake lotions based on calamine lotion of the National Formulary. No phenol was used in any of these preparations.

4. Liniments proved most valuable for the therapy of burns, the most common liniment used being the calamine liniment of the National Formulary.

5. Another useful preparation proved to be Lassar's

paste (plain) of N.F. VII. It is an excellent protective and a most soothing paste for many irritated dermatoses.

Ointments are, in general, not indicated in industrial dermatoses, for most of these eruptions are of an acute nature and ointments are contra-indicated in acute dermatoses.

A recent incident will illustrate that, while correct dermatological therapy is of immense value in these cases, an inadvertent word at the time of the examination may do much harm.

A physician in a small neighboring town examined a lacquer spray painter because of a rash on the latter's face and hands and told him that he had been "poisoned" by the lacquer. The report of this so-called "poisoning" spread rapidly through the plant and through the town, and 200 workers refused to work with articles that had been painted with the lacquer. An essential war plant faced a shut-down. Hurried consultation revealed that the man had a redness of the skin not unlike that seen from a mild sunburn. This was thought to be due to the defatting action of the lacquer thinners and treatment was directed to remedy this. Chemical analysis of the lacquer revealed that no health hazard was involved in working with it. After being reassured, the man returned to his work and was completely well within a few days.

Those examining industrial cases should forget the word "poison" while talking to workers.

Bibliography

1. Morris, G. E.: The Chemistry of the Wetting Agents. *J. Indust. Hyg. & Tox.*, in print.
2. Morris, G. E.: The Use of Dalibours Water in Dermatology. *New England J. Med.*, 229:509, 1943.
3. Davidson, F. R.: Synopsis of Materia Medica, Toxicology and Pharmacology. Third edition, 795 pp., St. Louis, C. V. Mosby Co., 1944, page 192.
4. Ormsby, O. S., and Montgomery, H.: Diseases of the Skin. 1360 pp., Philadelphia, Lea & Febiger, 1943, page 388.

Analysis of 1009 Consecutive Accident Cases at One Ordnance Depot

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General factors involved in the increase and decrease of accident frequency rates in various industrial plants, both government-operated and privately-operated, are well known. Mass statistics have been accumulated which indicate many causes of accidents. The chief disadvantage of the central registration of accident statistics from a number of industrial plants lies in the fact that, when a great variety of industrial processes are represented, the eventual statistical results arrived at are often not felt to have particular application to a particular plant.

Every plant has its own peculiarities, its own type of internal organization, and distinct types of employees. Other variables are the kinds of work performed, hours of work, and the problems peculiar to geographical location. The intent of this study is to show what facts and figures can be obtained through the medical department of an industrial plant engaged in a limited number of specific operations, and to analyze these facts and figures. The accumulated data, therefore, are as they relate to one particular organization, this ordnance depot. It is hoped that through this analysis, points applicable not only to this depot but also to others may emerge. Certain factors underlying accidents can never be determined, for example, fatigue from excessive home burdens, concentration on familial troubles rather than on the work at hand, and emotional disturbances unrelated to the job. Hence, this study may yield an indirect approach to solving some local problems unattainable by usual methods.

The Seneca Ordnance Depot is located at Romulus, New York, in northern New York State. The major operations here consist of the storage and shipment of all kinds of munitions and of a variety of combat equipment excluding such implements as tanks, trucks, heavy guns and the like. The vulnerable point, relating to accidents, is in the transfer of these items from railroad car to truck and thence to storage, and from railroad car directly to storage. The reverse procedures, that is, outgoing shipments, occur with equal frequency. The loads with which the individual worker finds himself concerned may vary from several pounds to one or more tons. Most of this labor is performed manually. On only the heaviest articles is mechanical lifting equipment employed. Aside from those engaged in the principal operations of the depot, there are the usual maintenance crews for buildings, roads, roadbeds and all other utilities, firemen, guards, and an administrative group, the latter being responsible for very few accidents. In general, most accidents occur in the course of lifting and moving various implements of war.

The personnel employed is almost entirely civilian and is drawn from a predominantly rural area encompassing a circle about the depot within a diameter of about 50 miles. Most of the laborers are enjoying their first experience in industry since, prior to the war, they were farmers. There is even now a distinct springtime trend away from the depot back to the farms, and there is a reverse trend in autumn. Mixed with this native rural group, there is perhaps an equal number of laborers who reside in the numerous villages and towns in this section, and among the latter the predominant type is native and first generation Italians with a sprinkling of many other European groups. The total number of civilians employed fluctuates from week to week, but now averages 2,000 persons. Of these 2,000 persons, approximately 1300 are males and 700 females. A further breakdown of the sexes into age groups is shown below:

AGE	NO. EMPLOYED MALE	FEMALE
17-21	73	118
21-28	201	218
28-35	260	220
35-45	276	97
45-60	411	67
60+	97	5

In the first two age groups (17-21, 21-28) approximately 50% of the females are employed in administrative capacities. Beyond these two groups, the number of females so employed is insignificant.

The medical facilities at this depot are available to the employees not only for the treatment of injuries incurred in line of duty but also for injuries suffered off the job and which can be treated while the patient continues with his work. Treatment is also afforded for all varieties of illnesses, which are treated only on an outpatient basis. The shortage of medical care in this rural area makes the latter function of the medical department an extremely vital one. No home calls are made, and the principle upon which the infirmary operates is to keep them well or get them well quickly. The facilities are freely available 24 hours a day throughout the entire week.

This study includes 1,009 cases and covers a period extending from July 19, 1943, to November 7, 1943, inclusive. Each case is a new one, and all cases are

consecutive, with no attempt made to select types or numbers of accidents. The methods employed in gathering data were extremely simple and required approximately 30-45 seconds more time for each case from each nurse or doctor. All the data appear routinely on the formal records of the infirmary. In order to consolidate this information so that it would be immediately available in a concise form and in daily sequence, a register was opened and placed on the desk where all injured personnel are interviewed. The date and day were noted for each day and the necessary information transcribed from the formal records to the register upon treatment of each case. This method obviated the necessity of further questioning of the patient and a resultant greater loss of time. To standardize diagnoses, a chart of diagnoses was drawn up and each diagnosis specifically defined. The number of hours lost when a patient is unable to do his work is always available to the medical department, since it is that department which declares an injured employee unfit for work, takes the patient's badge, issues a pass to get out of the depot, and then sees the employee first upon his return to work in order to evaluate again his condition and to have his badge returned to him. In estimating time lost on original visits to the infirmary (when the injured employee returns to his work after treatment) and upon re-visits for further treatment, a figure of 30 minutes has been selected. The depot encloses a tremendous area and the greatest part of time lost on visits to the infirmary is expended in transportation to the infirmary, waiting for a return ride to work and then the return trip.* All the statistics to be presented were gathered under the following headings in the register: Date, Day, Name, Badge No. (to determine what department the patient is in), Sex, Age, Shift Worked, Where Accident Occurred (job or home; the latter including to and from work, lunch hour athletics, etc.), Time of Accident, Diagnosis, and Time Lost. The last heading, Time Lost, was filled in only when the employee was unable to work and not until he returned to work.

Each item in the register was then tabulated, percentages calculated, graphs constructed and the results examined.

Certain limitations of this analysis are apparent. For one, no effort was made to ascertain the causes of the accidents. Most work at this depot is either out-of-doors or in unheated sheds and warehouses. The period covered in the study was the most favorable so far as weather is concerned. Winters are very bitter and both the accident rate and severity of many accidents can be expected to increase at that time. On time lost on original visits and on re-visits only an estimate is available, and it was thought better to err on the side of conservatism since the final tabulation of hours lost is of sufficient significance to emphasize the fact that even more time is probably lost than that indicated.

TABLE A.
SEX DISTRIBUTION OF CASES

		Percent of Total No. of Accidents	*Corrected Percent of Accidents
Cases 1009	Male 788	78%	59%
Re-visits 1164	Female 221	22%	30%

*By "Corrected Percent" is meant the % of accidents incurred by males and females in proportion to the actual numbers of each employed. It may be seen, then, that 59% of all male employees and 30% of all female employees suffered accidents.

*As soon as a patient has been treated, the designated motor pool for the department in which the patient works is contacted and request for immediate transportation made.

TABLE B.
SCENE OF ACCIDENT

	Job	Home	Unknown
	880	120	6
Percent	87%	12.5%	0.5%

TABLE C-1.
ACCIDENTS FOR ALL EMPLOYEES
CALCULATED IN TERMS OF RATE PER 1000

Age	Rate Per 1000
17-21	916
21-28	553
28-35	433
35-45	434
45-60	418
60+	333

IT IS APPARENT that the highest rate of accidents lies in the youngest group employed, with a progressive decline as age increases.

Extending this age-sex analysis further, the question arises as to what is the actual percent of accidents when corrected for numbers of men and women employed within a particular age group. The following table is revealing:

TABLE C-2.
DISTRIBUTION OF ACCIDENTS
ACCORDING TO
AGE, SEX AND PERSONNEL STRENGTH

Age	Male Accidents	Males Employed	Female Accidents	Females Employed
17-21	126	73	49	118
21-28	152	201	80	218
28-35	169	260	39	220
35-45	136	276	26	97
45-60	175	411	25	67
60+	34	97	0	5

1. Age group 17-21 is responsible for 17% of the 1009 accidents while constituting 9% of the employee strength.
2. Group 21-28 accounts for 23% of the accidents while constituting 20% of the employee strength.
3. Group 28-35, 20% of accidents and constitutes 23% of strength.
4. Group 35-45, 16% of accidents and constitutes 15% of strength.
5. Group 45-60, 20% of accidents and constitutes 23% of strength.
6. Group 60 +, 3% of accidents and constitutes 0.5% of strength.

TABLE C-3.
CORRECTED PERCENTAGES
OF
MALES AND FEMALES INJURED
ACCORDING TO AGE GROUPS

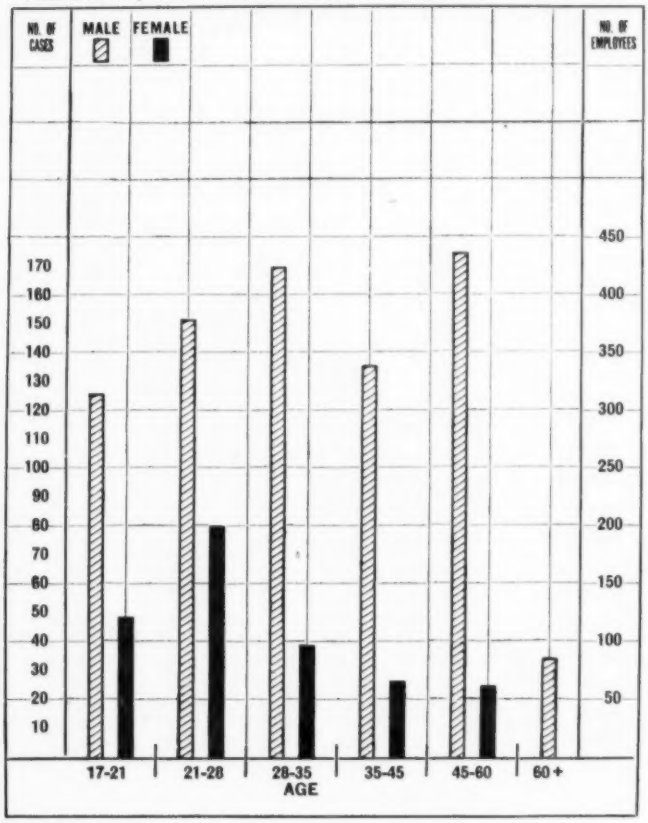
Age	Corrected Male %	Corrected Female %
17-21	172%	41%
21-28	75%	36%
28-35	65%	17%
35-45	50%	26%
45-60	42%	37%
60+	35%	0%

Among the youngest male group, 172% were involved in accidents, or, broadly speaking, there were almost two accidents per man. It is interesting to note that among the males there is a progressive decline in the number of men suffering accidents in proportion to their employee strength as their age increases; while with the women, the 17-21 age group has the highest percent, followed by a gradual decline until the 35-45 age group is met, where the percent begins to climb again.

Presented graphically, this is the picture:

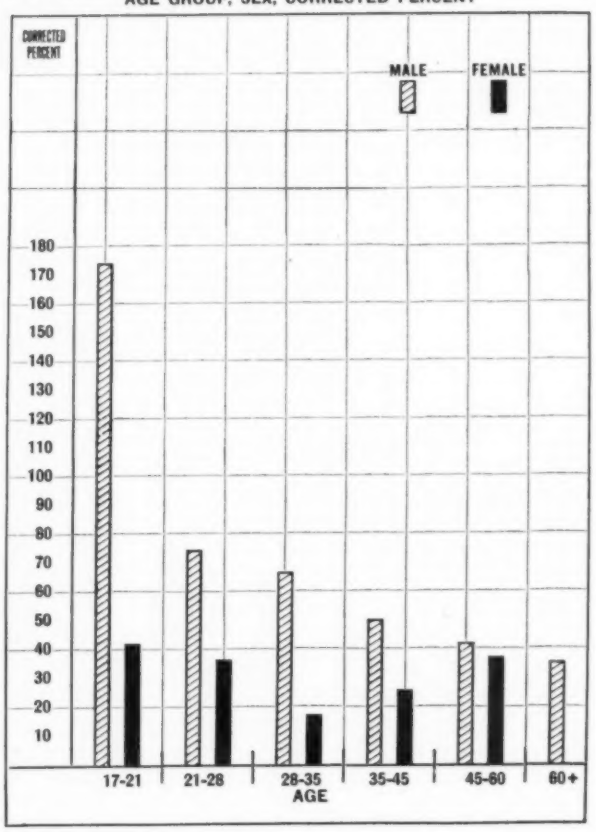
GRAPH 1A

AGE GROUPS, SEX, NUMBER OF CASES AND NUMBER OF EMPLOYEES



GRAPH 1B

PRESENTED AS CORRECTED IN TABLE C[1]
AGE GROUP, SEX, CORRECTED PERCENT



The frequency of accidents varies during the course of the work shift. It has been generally accepted that the greatest number of accidents occurs perhaps in the two-hour period prior to the close of the shift. Also accepted has been that this increase in accidents at that time was due to a combination of fatigue and boredom, with their concomitant drop in mental alertness and reflex reactivity. This question has been explored and each hour of the day analyzed from 7:00 A.M. until 6:00 P.M., 6:00 P.M. to midnight and midnight to 7:00 A.M. The reason for this grouping of time lies in the make-up of shifts at this depot. The majority of employees work six days, 10 hours a day, beginning at 7:00 A.M. and ending at 6:00 P.M. with 12:00 noon to 1:00 P.M. set as the lunch hour. All other shifts vary greatly. That the shift of importance to this study is from 7:00 A.M. to 6:00 P.M. is seen in Table D, where the number of accidents on various shifts has been determined.

TABLE D.
THE NUMBER AND PERCENT OF ACCIDENTS IN RELATION TO SHIFT

Shift	No. of Accidents	Percent
7:00 A.M.-6:00 P.M.	840	83%
7:00 P.M.-6:00 A.M.	30	3%
8:00 A.M.-4:30 P.M.	65	6%
Others	71	7%

GRAPH II

TIME OF ACCIDENT—NUMBER OF CASES

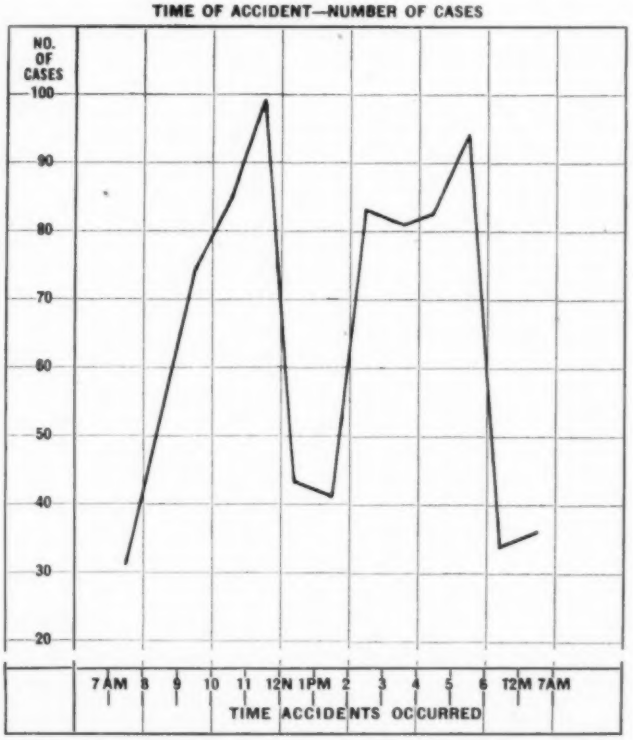


TABLE E.
NUMBER OF ACCIDENTS AND PERCENTAGES OF TOTAL IN RELATION TO TIME

Time	No. of Accidents	Percent of Total No. of Accidents
7:00 A.M.- 8:00 A.M.	31	3%
8:00 A.M.- 9:00 A.M.	55	4.4%
9:00 A.M.-10:00 A.M.	75	7.4%
10:00 A.M.-11:00 A.M.	85	8.4%
11:00 A.M.-12:00 N	99	9.8%
12:00 N -1:00 P.M.	*43	4.2%
1:00 P.M.-2:00 P.M.	41	4.0%
2:00 P.M.-3:00 P.M.	83	8.2%
3:00 P.M.-4:00 P.M.	81	8.0%
4:00 P.M.-5:00 P.M.	83	8.2%
5:00 P.M.-6:00 P.M.	94	9.3%
6:00 P.M.-12:00 MDT.	34	3.3%
12:00 MDT.-7:00 A.M.	36	3.5%
Time Unknown	153	14.0%

*Of these 43 accidents, 19 were the result of playing football and baseball during the lunch hour.

The numerical interpretation of these results is clear enough. The highest incidence occurs between the hours of 11:00 A.M. and 12:00 noon, the hour before lunch. The fall after lunch is abrupt and large. Then a rather sharp rise at 2:00 P.M., a relative plateau for the next two hours, followed by a rise to the second highest peak of the day in the hour just before ceasing work.

TABLE F. HOURS LOST

A. Hours lost due to injuries which prevented employee from working	3,921
*B. Hours lost on original visits to infirmary (excluding those in A)	528
*C. Hours lost on re-visits	582
Total	5,031

*30 minutes per visit.

Table F does not include the case of one woman who lost 132 days owing to infection of arm following pre-employment vaccination for smallpox.

There were 53 lost time cases in the period studied. Average daily time lost over period studied—45.3 hours.

TABLE F-1.
HOURS AND PERCENT OF TOTAL LOST DUE TO ACCIDENTS ON AND OFF JOB

Job	Home
4,871—(96.3%)	160—(3.2%)

GRAPH III

DEPARTMENT—NUMBER OF HOURS LOST

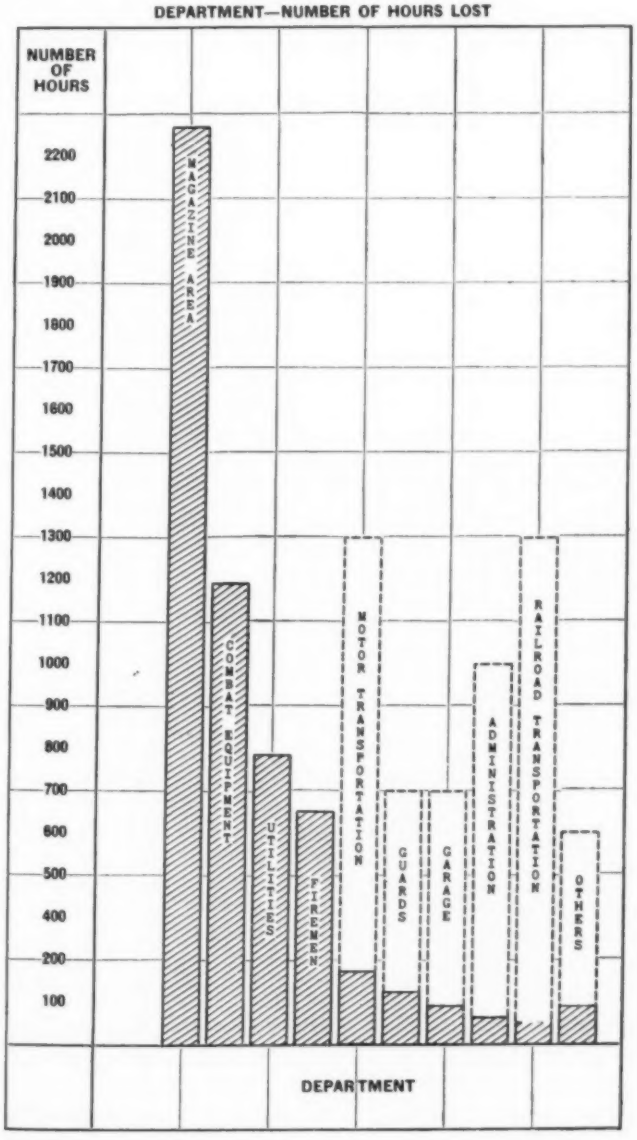


TABLE G.
DISTRIBUTION OF HOURS LOST BY DEPARTMENTS

Departments	Disabled	Orig. Visit	Revisits	Total
Magazine area	1602.5	256	313	2171.5
Combat equipment	961	63	58	1082
Utilities	538.5	88	54	680.5
Fireman	516	16	15	547
Motor transportation	120	27	35	182
Guard	77	17	20	114
Garage	50	15	11	76
Administration	40	12	5	57
Railroad transportation	16	14	21	51
Others (D.P., Med., etc.)	—	30	40	70

TABLE H.
NUMBER OF EMPLOYEES, NUMBER OF CASES, PERCENT OF TOTAL NUMBER OF EMPLOYEES AND PERCENT OF TOTAL NUMBER OF ACCIDENTS IN EACH DEPARTMENT

Department	Number Employees	No. Cases	% of Total No. Employees	% Total No. Accidents
Magazine area	743	492	36%	48%
Utilities	349	157	17%	15%
Combat equipment	165	105	8%	10%
Motor transportation	165	53	8%	5%
Surveillance—Renovation	30	47	1.4%	4%
Guards	164	34	8%	3%
Firemen	71	32	3.4%	3%
Railroad transportation	112	28	5.4%	3%
Others (Admin., D.P., etc.)	244	60	11%	6%

Monday is seen to have the fewest number of accidents. The precipitous drop on Sunday is accounted for by the fact that on that day, fewest employees are at work, the employees present consisting mostly of maintenance crews only.

TABLE I.
RELATIONSHIP OF THE NUMBER OF CASES AND THE PERCENT OF TOTAL TO THE DAY OF EACH WEEK

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
No. Cases	142	176	156	170	166	158	40
Percent of total	14%	17%	15%	17%	16%	15%	3%

Average daily new cases 9.1
Average daily re-visits 10.5

TABLE J.
TYPES OF INJURIES, NUMBER OF EACH, AND PERCENT OF TOTAL

Diagnoses	No. Cases	Percent of Total
Contusion, foot	60	5.5%
Contusion, leg	46	4.2%
Contusion, hand	88	8.1%
Contusion, arm	24	2.2%
*Fracture, foot	22	2.1%
*Fracture, hand	17	1.4%
Abrasion, foot	72	6.6%
Abrasion, hand	74	6.8%
Laceration, foot	23	2.1%
Laceration, hand	144	13 %
Sprain, ankle	30	2.7%
Sprain, wrist	27	2.5%
Strain, muscle	60	5.5%
Strain, back	54	5 %
Foreign body, eye	75	6.9%
Puncture wound, foot	30	2.7%
Puncture wound, hand	45	4.1%
Occup. skin rash	14	1.2%
°Head injury	51	4.7%
°Miscellaneous	123	11 %

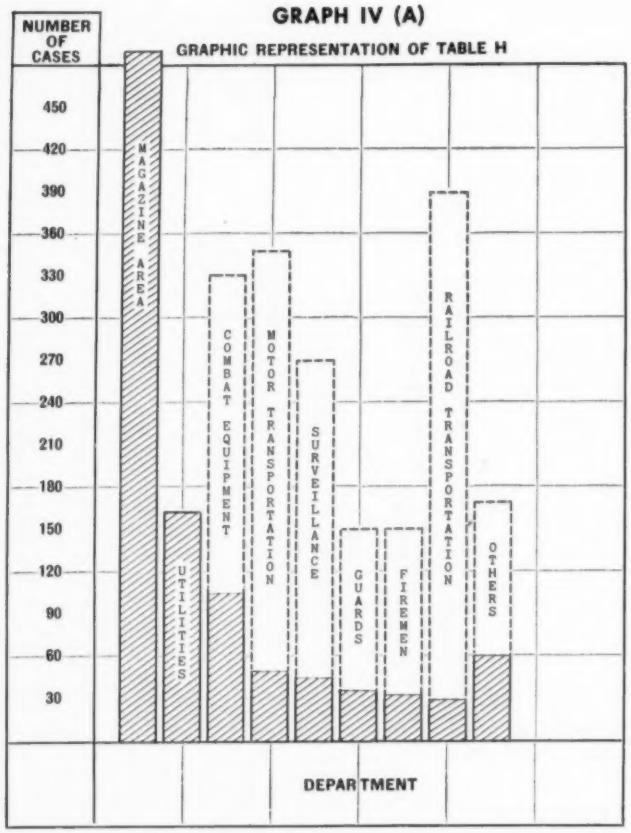
*Fracture, foot and hand includes leg, thigh, forearm, arm, etc.
°Head injuries include injuries to face, lips, and head.
°Miscellaneous includes variety of injuries, such as contusions of parts other than noted above, varied sprains and strains.

EXAMINATION of the statistical data presented reveals distinct tendencies in the occurrence of accidents at this depot.

The first of these answers a definite question of this depot with regard to whether women are more or less prone to accidents than men. (See Tables C-2 and C-3.)

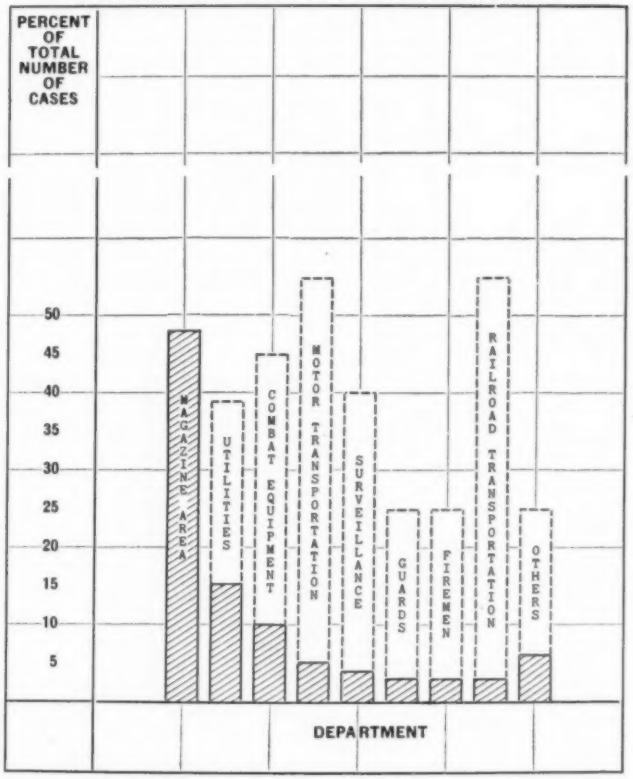
GRAPH IV (A)

GRAPHIC REPRESENTATION OF TABLE H



GRAPH IV (B)

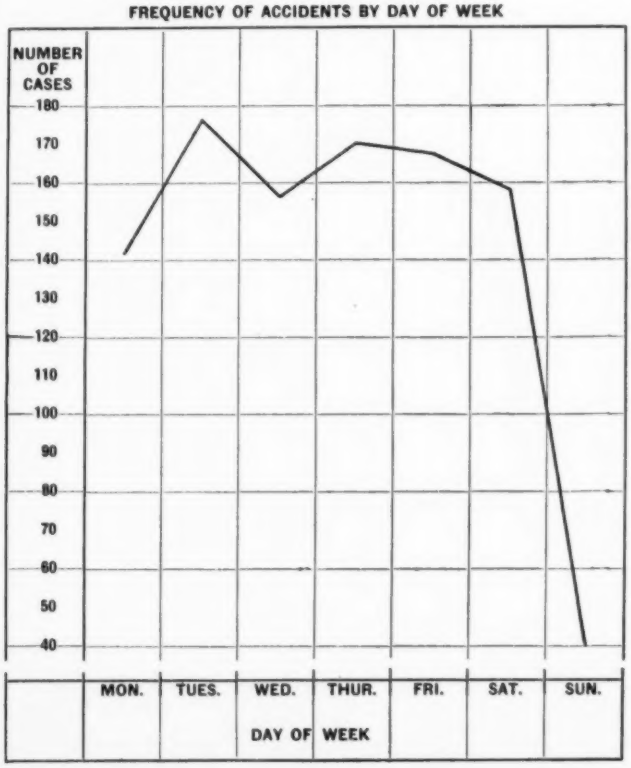
DEPARTMENT—PERCENT OF TOTAL NO. OF ACCIDENTS



Experiences of different industrial organizations vary on this point. "Accident proneness" is a real factor despite the fact that it defies absolute definition. Our experience here shows that the women employees of this depot suffer many fewer accidents than the male employees. If the objection is raised that so many women are engaged in entirely non-hazardous administrative activities, it may be pointed out that, even if we were to correct our statistics in the female age groups 17-21 and 21-28 and eliminate all administrative employees, the accident rate would still be higher among the men. It should be borne in mind, too, that there are very few types of work at this depot where women are not employed.

GRAPH V

FREQUENCY OF ACCIDENTS BY DAY OF WEEK



The factors underlying the superior performance of the women here are not difficult to evaluate, and it is very likely that these factors operate throughout the country. Without regard for assessing order of importance, women are less prone to accidents for the following reasons:

1. As a group, women are more meticulous and fastidious in the performance of a job than are men.
2. Women fear the consequences of an accident to a greater degree, and hence comply more strictly with existing safety regulations.
3. Women working with men on an equal basis as to types of work, hours and rates of pay are eager to prove that equality and again will abide by all depot regulations more strictly.*
4. That women adapt themselves more readily to routine, even monotonous work, has been long established. This adaptation is, in itself, a safety factor.
5. Accidents due to carelessness resulting from "showing-off" and boasting, a not unusual condition among men, are not likely to occur with women.

The second tendency noted is indeed interesting. The disproportion in accident rates between the youngest age group and all other groups goes far beyond mere coincidence or accident in the particular sample chosen.

Applying the data pertinently to this depot, what lies behind the high casualty rate among the youngest group, both male and female? An enumeration reveals these factors:

1. Lack of experience. For many in this group, this is their first work experience. There are no past ex-

*For example, there have been no cases of women brought to trial for violations of smoking rules, no matches, etc.

periences, either good or bad, to draw upon as a laborer.

2. Carelessness goes hand in hand with youth and the degree of carelessness is proportionate to the amount of responsibility which rests upon the youthful laborer. In most cases, there are other wage earners in the family and the present job is usually one assumed in the spirit of contributing to the war effort or "cashing in" on the salaries so easily obtained. Where getting a job means doing so to support others, the gravity of the loss of salary for one day due to accident is all too real.

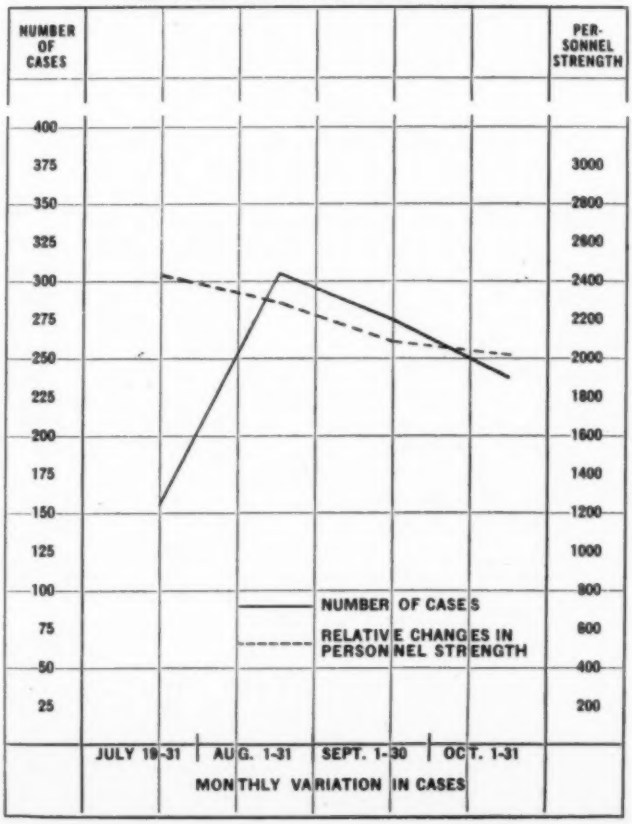
3. Monotony of work is a much greater problem among youthful workers of both sexes than among the older. Rapidly shifting interests and the search for something new and different, expressed to its greatest degree in the baby who plays with a new toy but for a few minutes and then seeks something else, is a problem which besets the employment of very youthful workers in hazardous positions.

4. Eagerness to get a job done with quickly, albeit carelessly and sloppily, to impress older employees with their speed, skill and strength.

It is interesting to note, too, that a large number of the males in this youngest group were either awaiting their draft call or were students exempted, for the time, from military service and were gathering some extra money during the vacation period. Can their performance here be correlated with their performance as aviators, gunners, paratroopers, and other highly skilled military personnel? If the facts here can be properly and correctly transferred to serve as an index to performance in the military services enumerated above, the assumption follows that they are not particularly suited for such work. An accident casualty in the armed forces renders a man a non-effective just as thoroughly as does a bullet. On the other hand, the

GRAPH VI

MONTHLY VARIATION IN NUMBER OF CASES
RELATIVE CHANGES IN PERSONNEL STRENGTH



males of age group 21-28 show a 57% drop in accident rate as compared to the 17-21 group. Among many other factors, this may indicate a more precise and more rapid reflex reactivity on the part of the older group and hence their greater adaptability as aviators, gunners, etc.

The third observation concerns the accident rate at various hours during the day. Contrary to general experience, the greatest number of accidents are found to occur in the hour before lunch, i.e. 11:00 A.M.-12:00 noon. What happens during that hour is actually the accumulation and accentuation of what has been happening during all the work hours prior to 11:00 A.M. These factors are:

1. Increasing hunger. In order to be at work by 7:00 A.M. the majority of employees probably take their breakfast sometime between 5:00 A.M. and 6:00 A.M. since in most cases the hour between 6:00 A.M. and 7:00 A.M. is consumed in driving to work. Then, too, it may be assumed that the average breakfast is light, particularly when one must awaken at such an early hour. Knowing that many workers often fail to have breakfast altogether, a coffee shop has been opened just beyond the time clocks and within the confines of the depot where coffee and doughnuts are available before proceeding to work. This is, at best, a poor substitute for a nutritious breakfast and serves unquestionably more to bolster morale than to provide nutrition. Hence, a period of some six hours elapses before the worker can consume the first decent meal of the day. Severe hunger ensues and with it occur specific physiological changes and concomitant physical reactions. With hunger, there may be nervousness, headache, and even dizziness. Judgment is impaired, primarily because of concentration on the discomfort of hunger, and the all-consuming desire to satisfy the hunger. With hunger, the level of blood sugar often drops and so creates a demand on reserve glycogen stores in order to provide more energy for work. This is then followed by the more rapid onset of fatigue in the face of diminishing glycogen reserves. With all of these effects in operation, the accident rate is bound to rise.

2. Inspection of Graph II reveals a progressive increase in accidents as each hour of the morning goes by. Physical fatigue is effective here even in those who are not hungry. In four hours (7:00 A.M.-11:00 A.M.) of steady work, the element of fatigue becomes very important. It is well to note that at 2:00 P.M. the rate again rises abruptly and this, too, is not without reason. When muscle fibers once become fatigued, then, after a brief rest, the period of work necessary once more to produce fatigue becomes shorter. This process is progressive, so that rest periods eventually must come closer and closer together. The greatest productivity must take place when the greatest amount of physical endurance is available. From the observed data, this optimum period of available endurance is from 7:00 A.M. to 11:00 A.M. and from 1:00 P.M. to 3:00 P.M. Thus, a four-hour period is available in the morning and only half that amount in the afternoon. The rationale of the six-hour work day in peacetime becomes more reasonable when viewed in this light. Note, too, that from 2:00 P.M. until 6:00 P.M. the rate stays high, and that between 5:00 P.M. and 6:00 P.M. fatigue, boredom and perhaps again hunger wreak a number of accidents but slightly lower than the peak between 11:00 A.M. and 12:00 noon.

Perusal of Graphs III, and IV (a) and IV (b), discloses a readily understandable situation. The magazine area is responsible for most accidents and the

greatest number of hours lost therefrom, followed at a respectable distance by the combat equipment area. The magazine area not only has the largest number of employees among all departments but also is engaged in the most hazardous kind of work. The expectancy rate is considerably higher in this department than in the others.

An institution that belongs to the American scene is the time-honored "Blue Monday." On Monday, however, fewest accidents occur at this depot. On Tuesday, there is a rise and then a relative plateau for the remainder of the work week. There can be no doubt that the lower incidence on Monday can be correlated with the preceding day of rest. At one time, all employees worked a 70-hour week. Unfortunately, statistics are not available for that period of time, hence no comparison can be made. Indirect evidence is available, however. Since the change from a 70-hour week with almost equal numbers of workers on the day shift and on the night shift, to a 60-hour week with a day shift only, production has risen tremendously. The element of constant fatigue engendered by a seven-day week has been removed. There has followed an increase in production. The lower rate on Mondays is therefore due to the elimination of the fatigue and the monotony factors.

Graph VI illustrates an encouraging monthly decline in the total number of accidents. This progress, incidentally is a common experience now with almost all ordnance establishments. The role of the safety program in force cannot be minimized. There is, however, another important element present, the element of time and experience. The "ordnance industry" is a new one for the American people and, as with all new undertakings, the smooth-running organization becomes so only after time has permitted the accumulation of sufficient experience to warrant changes in procedure which it is known will be for the better as well as the retention of certain procedures. On the part of the worker, he has now learned his job and the pitfalls lurking in it. The combination of cumulative experience of both management and labor is beginning to show its results along with the operation of elaborate safety programs. At this depot, the turnover of laborers is now on the decline. Each crew has become thoroughly familiar with its work and the hazards of the work on hand.

In tabulating the types and numbers of particular injuries, the data obtained coincide with those found at similar ordnance depots. The most frequent accident is found to be lacerations of the hands, followed in second place by contusions of the hands. It has been said that the hands of man are the most ungainly part of him. The high incidence of hand lacerations, is, for the most part, the result of objects falling on them, or having the hand caught between two objects. Contusions result from similar accidents. Table J lists all the types of accidents encountered. Abrasions and contusions of the feet rank high. Then come a multitude of various injuries sustained. Note that 10.5% of the injuries are strained backs and strained muscles. The table is self-explanatory and the types of injuries are the kinds to be expected in the operations performed here.

Certain recommendations emerge from the body of accumulated data and related facts.

The employment of women need create no fears so far as increase in accidents is concerned. They may be assigned hazardous tasks with perhaps more equanimity than the assignment of men. The expression "That's too dangerous for a woman," no longer is tenable.

The employment of very young people on hazardous jobs can be expected to result in a marked increase in accidents. Therefore, unless skilled and experienced in a particular job, young people should be confined to relatively non-hazardous jobs.

Earnest consideration should be given to changing the lunch hour to 11:00 A.M., possibly 11:30 A.M., with a 15-30 minute break at 3:00 P.M., at which time small amounts of foods of high caloric value (but not at the expense of proteins, vitamins, minerals, etc., as is the case with candy and soft drinks) should be available. If these changes reduce the accident rates at the two highest peaks of the day, they will be well warranted.

One day off each week is not only salvation for the employees from ever-present fatigue, but is also the best economy for the organization in that production is increased with it and accidents, at least on the next day, are fewest in number.

The fact that 50% of the accidents occur in the magazine area indicates the need for a still more intensive safety program.

A total of 5,031 hours were lost over a period of 111 days; the equivalent of 503 men working one full work day. If the loss of man-hours can be further reduced as a result of the data made available in this paper, then the intent of this study will have been realized.

Summary

ONE thousand and nine consecutive accident cases occurring at an ordnance depot have been analyzed. The chief purpose of this analysis has been to show what information on accidents can be obtained through the medical department with a minimum of extra detail and the application of said information in a safety program. Conclusions have been sought and recommendations proferred.

Treatment of Sprained Ankle

—With Combination Pressure Bandages—

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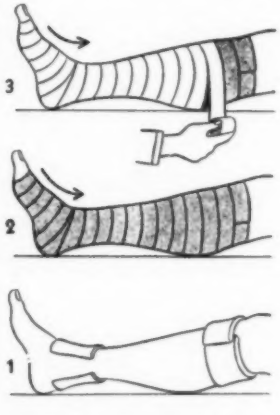
THE relation of trauma to phlebitis in the lower extremities has been rarely described in medical literature.

Martland[1] cites a case of death from pulmonary embolus following a sprained ankle. On autopsy the deep veins of the calf were thrombosed with red clots, and fragmented emboli packed both branches of the pulmonary artery. Homans[2] reports thrombosis in the deep veins of the leg following a strain and a twist. Kaplan[3] has described several cases of thrombophlebitis following sprains.

De Takats[4] also mentioned sprain of an ankle or of the knee which resulted in thrombosis in normal non-varicose veins.

Every injury is followed by a non-bacterial inflammation which is part of the natural healing process. When a person injures his



1—Protect instep, Achilles tendon and region directly below knee with gauze spread with vaseline.

2—Apply Contura bandage loosely.

3—Apply Plasto bandage over Contura bandage under STRONG pressure.

leg, this inflammation, though helpful in healing the injury, nevertheless at the same time also affects the adjoining veins, causing at first a non-bacterial phlebitis.

But in any inflamed area there is always a congestion; and this makes it possible for germs to invade the tissues and give rise to a bacterial phlebitis which does not disappear when the original injury is healed, but persists as an independent disease. That is why we find phlebitis so frequently following fractures, sprained ankles, and even minor cuts and bruises provided they occur on the legs. This explains the strange fact that sportsmen and athletes, otherwise the most healthy and active members of the population, often suffer from phlebitis. Their activity exposes them to accidents and injuries.

In order to prevent phlebitis, or to heal it promptly if it has already developed, I have had best results in my cases of sprained ankle with the combination bandages as they are described for use in the treatment of phlebitis: The patient lies on a flat table. After protecting ankle and knee, the leg is covered loosely with a Contura bandage. Then, over this, a three-inch wide Plasto bandage is applied with strong pressure.

The combination of these bandages provides an elastic compression which is adaptable to the function of the muscles and joints. The soft Contura bandage does not become stiff, and it moves with the muscles. Its medication prevents irritation of the skin so often seen after the direct application of the elastic adhesive bandages, and it makes a comfortable treatment, even of long duration, possible.

Also the change of the bandage is easy, as this bandage does not stick to the hair of the leg, and thus shaving is not necessary.

In treating the legs below the knee, the bandage is started directly behind the toes and is wound up to the knee. The bandages are wrapped around the leg in the direction toward the heart. They must cover the foot, heel, and calf. Only the toes remain free.

The pressure must be even. If the correct pressure has been applied, the patient will feel a relief of pain immediately. If the pressure is too strong, the patient will complain about severe pain almost immediately after the bandage has been applied. He can bear excessive pressure for only a few minutes. If the bandage is too loose, the pain which the patient felt before application of the bandage will not stop. Then more pressure has to be applied. It is important to bandage the whole lower leg up to the knee in every case of sprained ankle, even if there are no obvious symptoms in the upper part of the leg at the time of the first examination. Palpation of the tibial vein in the calf region usually reveals tenderness. As the swelling subsides very quickly under the combination bandage it is advisable to change the bandage at least every second day. The patient should walk as much as possible immediately after application of the bandages in order to get the full benefit of the treatment. As a rule the patient feels relief immediately after application of the bandage and is able to walk without discomfort.

With this treatment the absorption of the exudate is encouraged. If the treatment is started early the edema which is largely due to circulatory stasis will be prevented. Under the combination bandage the injured ankle will heal promptly and the development of phlebitis will be prevented. In addition this treatment has the advantage of being ambulatory and not interrupting the patient's work.

References

1. MARTLAND, H. S.: Static or Spontaneous Thrombosis of the Veins of the Lower Extremity and Pelvis and Fatal Pulmonary Embolism Following Trauma and Surgical Operations. *Surg. Clin. N. A.*, April, 1941, 383-407.

2. HOMANS, JOHN: Circulatory Diseases of the Extremities, The MacMillan Company, 1939.

3. KAPLAN, THEODORE: Thrombophlebitis of the Veins of the Lower Extremities. *Industrial Medicine*, August, 1941, Vol. 10, No. 8, 328-331.

4. DETAKATS, G.: Trauma and Disease, BRAHDY and KAHN, 97, Lea & Febiger, 1937.

The Contura and Plasto Bandages referred to in this article are manufactured by the D. C. McLintock Co., 104 Verona Avenue, Newark, New Jersey.

Industrial Health Forum

—This Material is prepared by the Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, Boston—

QUESTION: Welding is done on a small scale in our plant and only for several hours each day. The shop is large and airy, but one of the welders states that the fumes make him cough. We have hesitated to put in ventilating equipment since conditions do not seem bad to us and we do not operate continuously. Is ventilation absolutely indicated for all welding operations?

ANSWER: In general, ventilation is necessary for all forms of welding, but the type of work determines the relative need. Metal fumes from lead, zinc and cadmium can cause severe injury to health, as can also the fumes from organic residues and fluorides in the fluxes and rod coatings. Welding of stainless steel, Monel metal, galvanized iron or lead painted surfaces is more dangerous than the welding of black iron. Protection is therefore indicated where hazardous materials are in use, and hence an analysis of the ventilation requirements for the type of welding done in your plant is indicated. Engineering assistance may be obtained from your Division of Industrial Hygiene, State Department of Health.

QUESTION: We have recently had to buy new solvents and thinners for our rubber cements. Some of these contain a very small percentage of benzol, but we are quite sure that the amounts present in these solvents (often less than 5%) do not create a hazard. We have been informed that they must be labeled as poisonous substances in spite of the fact that they contain so little benzol. Would you be kind enough to refer me to the law on this matter?

ANSWER: Benzol is an industrial poison and its use in any concentration may create a hazard, depending on its method of application and the amount vaporized. In Massachusetts all commercial preparations must conform to the Massachusetts Benzol Labeling Law, Sections 142A to 142F, Chapter 149 of the General Laws. This statute requires that, if benzol is present, the fact must be stated and the danger of poisoning emphasized in an adequate warning label. There is also a national agreement between benzol manufacturers and the U.S.P.H.S. with reference to the use of warning labels on all containers.

QUESTION: One of our workers recently got a splinter of aluminum in his finger. He went to the first aid room and was treated within 20 minutes of the injury. Our nurse found the hand swollen, and she immediately referred him to the hospital where the doctor said he had "gas gangrene." We understand that this is a virulent germ and are afraid that other

workers getting splinters may get the same thing. Is it necessary to disinfect the plant to prevent a recurrence of this infection?

ANSWERS "Gas gangrene" is an infection caused by a germ usually found in the soil and occasionally complicates industrial wounds accidentally. Disinfection of the entire plant is not indicated, but it would be advisable to disinfect the first aid room thoroughly by washing the walls and equipment with a commercial disinfectant.

In view of the fact that the injury was caused by aluminum, the possibility that this was not "gas gangrene" must be kept in mind, since magnesium, which is frequently used as an alloy with aluminum, will cause a similar injury. Careful inquiry should be made as to the bacteriological findings in this case to ascertain whether "gas gangrene" bacilli were cultured from the wound. Aluminum alloys containing less than 1% magnesium can produce "gas" in the tissue closely simulating the lesion of "gas gangrene."

QUESTION: Our company has recently installed an x-ray machine for the examination of welded parts. It is in a separate room and well insulated. Our workers think that special precautions are necessary. Would you please inform us regarding any special examinations indicated?

ANSWER: Scatter or secondary radiation is emitted by even well constructed x-ray machines, and large amounts may be harmful to exposed workers. All unauthorized individuals should be kept out of the area. The extent of the hazard may be measured by special tests. X-ray technicians should be advised of the importance of working behind the protective screens, and they should be allowed at least four weeks' vacation a year, two weeks of which should be during the summer months. Complete blood counts should be done on each of these workers monthly.

QUESTION: We have a chrome plating tank in operation, and recently one of our workers developed a cough and nosebleed. He went to his local doctor who said that his "lungs were lined with chrome." This has created a great fear in the other workers, and we are having difficulty in convincing them that the operation is not harmful. Is there anything to the story that chrome will line the lungs?

ANSWER: Chrome electroplating may produce chromic acid in the atmosphere in sufficient concentrations to produce dermatitis, nosebleed and irritative cough. However, it does not "line the lungs." The symptoms described are consistent with exposure to chromic acid, and unless such exposure is checked, bleeding of the nose may continue until ultimately the septum of the nose is perforated and also a severe dermatitis may develop. A maximum allowable concentration has been established below which no injury will result. Atmospheric studies are therefore indicated, and if the concentration is found to be above the accepted limit, mechanical ventilation will be necessary.

QUESTION: It has become known among workers that one of their fellow employees has syphilis. We talked with this man and found that he has been treated for the last two years and is apparently in good health. He works at a lathe and is a very good operator. While we would like to keep the man, if he is dangerous to others we will have to discharge him.

ANSWER: Venereal diseases are transmitted in practically all instances by sexual contact, and therefore there is no danger of casual transmission of this disease under working conditions. Furthermore, the disease is contagious only in the active stages and is not infectious after three months of treatment. It is obvious, therefore, that the danger to others is practically non-existent. Under no circumstances should employment be refused a venereal disease patient who is under proper medical supervision. If the worker is exposed to toxic chemicals which may affect the central nervous system, it would be advisable to transfer him to another job. In the situation you describe, no harmful effects can result from his employment.

QUESTION: We would like to provide better facilities for our workers health, but our plant is too small to employ a full-time nurse. Does the state provide part-time industrial nursing service?

ANSWER: No, most states do not offer any direct industrial nursing service, but an industrial hygiene nursing consultant is available through the Divisions of Industrial Hygiene in some states. In many communities the visiting or public health nursing organization will provide part-time nursing service to industry. We would advise you to get in touch with the Visiting Nurse Association of your community or write to your State Department of Health.

QUESTION: We have a training school for machinists to be employed in our plant. Our safety engineer has advised us not to start the training of men who have oily skins, as they will probably develop dermatitis and may not be able to continue. We did have one case of a man who was trained and had to quit because of troublesome pimples. Can one tell who will develop a dermatitis? If this is possible, it would save many man-hours of training.

ANSWER: It is impossible to know with certainty by pre-employment examination who will develop dermatitis and who will not. There are many factors which determine whether or not a man will develop dermatitis, and it is true in some measure that the type of skin predisposes to certain types of dermatitis. Workers with thick, oily skins are more apt to develop cutting oil dermatitis, but these people usually are more resistant to solvents than those with thin skin. Moreover, some people have a specific sensitivity to the action of certain substances. The problem of dermatitis is chiefly one of personal hygiene, and if in the training period the worker is impressed with the necessity of minimizing contact with the oil, keeping himself clean by frequent washing with a bland soap, wearing clean clothes, using clean wipes and avoiding harsh abrasives, the incidence of dermatitis will be greatly reduced.

THE following is from "Medical Service for Workers in Smaller Plants," recently issued by the Health Advisory Council of the Chamber of Commerce of the United States: "It has, for example, been shown that in recent years the cost of industrial medical service per employee has been running from $4.50 to $11.00 per year, with the higher costs of course in the smaller plants where overhead bulks larger. In the case of five smaller manufacturers in Philadelphia, in plants ranging from 100 to 550 employees each, the cost of organized medical service ranges from $.39 to $.93 per employee per month, or $4.68 to $11.16 per year. To the level-headed manager it must be obvious that this cost item is emphatically a 'buy' as compared with the loss of time, morale and efficiency, and the larger disruption of production lines which follow unorganized health conditions in plant, office, or store. Particularly is this true at times when substitute workers are simply not to

be had on short notice. Perhaps most important of all factors in the trend toward a company medical service is the change in viewpoint on the part of management, workers and the medical profession, from the rugged individualism of past generations to a viewpoint of adjustment to new times, new conditions and new ideas. Now the cost of illness and accident to the family, the industry, and the community is well recognized."

Practical Management of Arthritis

—Medical and Orthopedic—

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WHILE the conservation of manpower is always essential, especially at this time when there are labor shortages in practically all industries, the preservation of health and the maintenance of physical fitness are doubly important. Since arthritis is notably a disabling disease any therapy which serves to alleviate its symptoms becomes of interest to those who are entrusted with the health supervision of industrial workers.

THE multiplicity of therapeutic measures suggested for chronic arthritis indicates clearly that no one method of treatment is specific or capable of being relied upon to give relief to all patients.

In most clinics, the arthritic patient is a "football," tossed indiscriminately from one service to another, each of which is anxious to send him elsewhere because of the time consumed in his care and the apparent hopelessness of the outlook in many instances.

For this reason, it was deemed advisable to establish a clinic for the management of arthritic patients. The principle upon which the clinic was formed has been aptly stated by Nissen[1] and later by Block, Buchanan and Freyberg,[2] who stressed the need for treating the individual patient and all of his abnormalities of metabolism and function, including his nervous and emotional idiosyncrasies. Pemberton and Scull[3] have also concurred in this view. They believe that recovery may definitely be hastened if every disability of the patient is considered and every pathologic aspect noted. The problem should include all deviations from normal.

Organization of Clinic

THE Arthritis Division* of the Orthopedic Clinic of Cook County Hospital was started in April, 1941, with the consent of the Executive Committee of the Cook County Hospital. One section of the orthopedic clinic was selected for the observation and treatment of arthritic patients. The procedure at this clinic has been previously described.[4] The Social Service Department played an important role in the operation of the clinic by correlating the prescribed management with that offered in other clinics, by assisting in home and economic problems of the patients, by aiding in the procurement of orthopedic appliances and special diets, and by maintaining the close contact required by the doctors. The good will engendered by this department appreciably improved the cooperation of the patients.

Once a patient had been referred to the arthritis clinic, he was received by an internist, who, with the help of a secretary, wrote a detailed history and summed up his complaints, noting whether the disease was quiescent or slowly or rapidly progressive, whether or not there were remission periods, whether or not there was evidence of focal infection, etc. The physical, mental and emotional status as described by the patient was also recorded. The patient was then transferred to a second internist, who gave him a complete medical examination. During this examination, signs or complaints of an orthopedic nature were noted and, when present, the patient was referred to the orthopedic section of the clinic or was hospitalized, if necessary.

Following the physical examination, routine laboratory tests were conducted, as well as any special tests indicated. Routine tests included blood chemistry (N.P.N., creatinine, uric acid, calcium, phosphorus and phosphatase), complete blood count, sedimentation rate and serologic tests for syphilis. Routine complete blood chemistries were abandoned after the clinic had been in existence for one year, because it was found that such examinations were of no practical value. The sedimentation rates and serologic tests for syphilis were continued. The uric acid determinations were made on practically all patients. Special tests, including basal metabolism, liver function and gastric analyses were made when indicated.

Motion pictures in natural color were taken of some of the patients in order to show the contours of the involved joints, the degree of motion, posture and locomotion. A number of still photographs were also made, illustrating some of the types of arthritis treated in this clinic.

Since arthritis is usually a chronic and often progressive disease, in many of the patients who presented themselves to the clinic for treatment irreparable damage to the joint structures had already occurred, so that complete return of function in the advanced cases could not be hoped for. However, the main purpose of the clinic was to restore these patients to as great activity as possible in consideration of the extent of involvement.

Obviously, the first step was to classify the patients as to the type of arthritis present, for only then could the treatment be individualized in the manner which would be most conducive to success. The following classification, prepared by the Sub-Committee of the Arthritis Welfare Council of New York City was used. This classification appeared to us to be the most concise and complete. It is based on sound reason, in so far as our knowledge of arthritis permits at present.

From the Fantus Out-Patient Clinic, Cook County Hospital, Chicago, Illinois.

CLASSIFICATION OF DISEASES INVOLVING THE JOINTS

A. Infectional arthritis of proved etiology (Microorganism to be specified).
B. Probably infectional; etiology unproved:
  1. Arthritis of rheumatic fever.
  2. Rheumatoid arthritis (atrophic arthritis, chronic infectious arthritis):
    (a) Adult type.
    (b) Juvenile type (Still's disease).
    (c) Ankylosing spondylitis (Marie Strumpell, ankylopoetica, etc.).
    (d) Psoriatic arthritis.
  3. Arthritis associated with various infections.
C. Degenerative joint disease:
  1. Osteoarthritis (hyperthrophic arthritis, degenerative arthritis, osteoarthrosis):
    (a) Generalized.
    (b) Localized:
      (1) Secondary to previous trauma (specify).
      (2) Secondary to structural abnormality (specify).
      (3) Secondary to previous infectional arthritis (specify).
      (4) Cause unknown.
D. Arthritis associated with disturbance of metabolism:
  1. Gout.
  2. Arthritic manifestations of other metabolic diseases (specify).
E. Arthritis of neuropathic origin:
  1. Secondary to tabes dorsalis.
  2. Secondary to syringomyelia.
F. Neoplasms of joints (cyst; xanthoma; hemangioma; giant-celled tumors; synovioma) specify.
G. Mechanical derangements of joints:
  1. Traumatic arthritis (nature of injury to be specified).
  2. Joint disturbance secondary to abnormal postural strain.
H. Miscellaneous forms:
  1. Manifestations of systemic disease:
    (a) Arthritis of serum sickness.
    (b) Arthritis of hemophilia.
    (c) Intermittent hydrarthrosis.
    (d) Pulmonary osteoearthropathy.
    (e) Hysterical joints.
  2. Local joint disturbances:
    (a) Aseptic bone necrosis:
      (1) Secondary to contusion, fracture, dislocation or air embolism.
      (2) Of unknown etiology (juvenile osteochondritis, Legg-Calve-Perthe's disease; Kohler's disease; Freiberg's disease; Osgood-Schlatter's disease).
    (b) Osteochondritis dissecans.
    (c) Osteochondromatosis.

Analysis of Cases

THE series of 164 patients reported included 70 cases of degenerative joint disease (hypertrophic arthritis, degenerative arthritis and osteoarthrosis). Among this group were two cases of Paget's disease with structural abnormalities and nine cases of malum coxae senilis, in which case the arthritis was secondary to the structural abnormalities. There were 50 cases of rheumatoid arthritis (atrophic arthritis, chronic infectious arthritis). Most of these were of the usual adult type. There were, however, two cases of the juvenile type (Still's disease) and three cases of ankylosing spondylitis (Marie-Strumpell). There were also four cases of arthritis associated with definite disturbance of metabolism, in all of which gout was a contributing factor. Practically every type of arthritis noted in the preceding classification was encountered either in the clinic or in the private practices of the authors. Early cases of arthritis of any type were not included in this series.

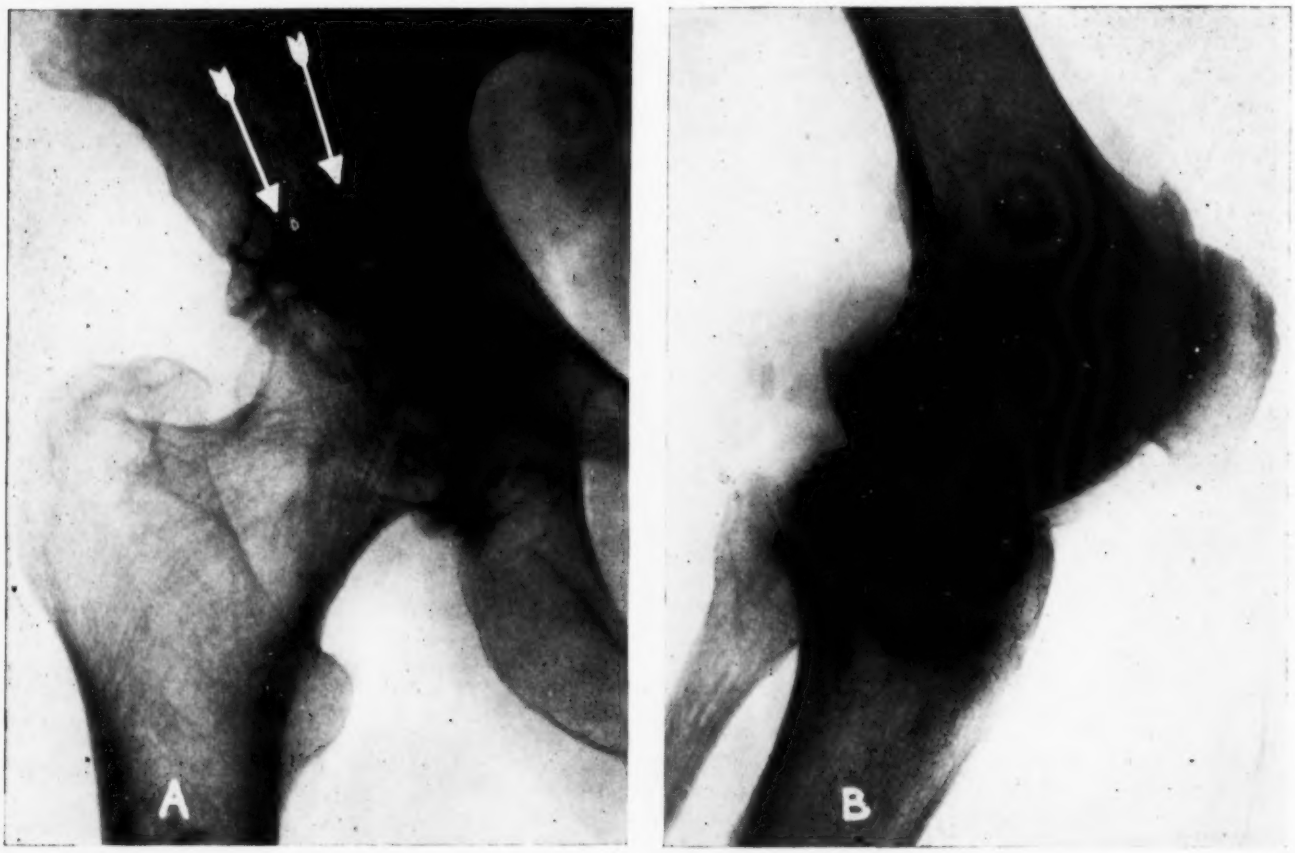


Fig. 1.
A—Malum coxae senilis with juxta-articular cyst. B—Eburnated arthritic knee joint.

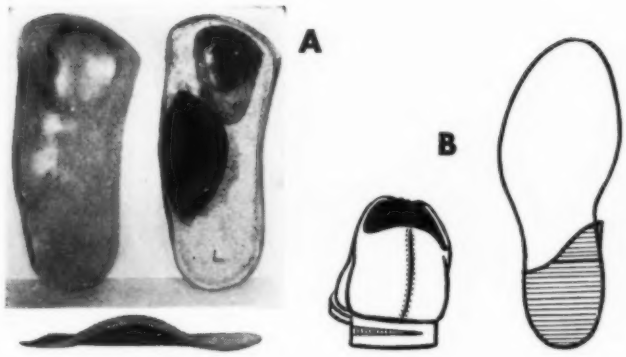


Fig. 2.
A—Flexible type of arch support for the longitudinal and transverse arches. B—Thomas Heel with inner heel wedge—usually 3/16 inch. C—Metatarsal ball.

Orthopedic Management

THERE is no question that trauma and faulty body mechanics contribute to the development of arthritis and tend to aggravate the disease. *Too often, medication administered internally and applied externally is condemned as a failure when an anatomical derangement, which aggravates the disorder, has not been corrected or alleviated (Fig. 1).*

In treating arthritis from the orthopedic standpoint, the first consideration should be a general inventory of the patient, including the range of motion of the affected joints, local contours, local heat, muscle power, local muscle atrophy, malnutrition, or obesity, poor body posture and abnormalities of the lower extremities such as bowlegs, knock knees or flat feet.

Roentgenograms of the affected parts are essential for a proper preliminary inventory and as a check on progression or retrogression.

FEET: Flat feet may not necessarily give symptoms in the foot, but because of the poor foundation they offer for support of the body, they may cause muscle and ligamentous strain in the limbs or in the lower back. Certainly there is always more or less severe strain on the medial ligaments of the knee joint in a person who has flat feet. However, flat feet which compensate for bowlegs usually require no correction.

We have found that usually a flexible type of arch support in a shoe (Fig. 2A) with an orthopedic heel, elevated 3/16 of an inch on the inner border, and a rigid shank is often sufficient for the correction of poor foot mechanics (Fig. 2B).

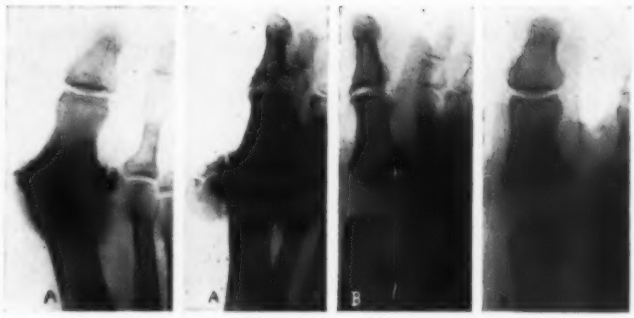


Fig. 3.
Hallux rigidus. A—Before operation. B—After arthroplasty.

One of the simplest and most efficient devices for the relief of painful metatarsals is the metatarsal bar or crescent, designed by Sir Robert Jones and since modified in one manner or another by various authors (Fig. 2C).

Arthritis involving the big toe joint with proliferation of bone, resulting in hallux rigidus, causes greater disability than that produced by limited motion (in the position of election) of the ankle, knee or hip. Hallux rigidus is easily corrected by a simple arthroplastic procedure (Figs. 3A and 3B). Metatarsophalangeal rigidity with claw toes is best treated by resection of all the metatarsal heads. In certain cases of gout the tophaceous deposits may be removed (Fig. 4).

Painful intertarsal arthritis with erosion of surfaces and osteophytes is best treated by arthrodesis.

KNEES: Treatment of the arthritic knee joint should be decided upon only after careful physical and roentgenologic examination. If the synovial membrane is thickened and the knee lacks full extension, and the roentgenograms show few changes, the patient may be treated conservatively by recumbency, traction and physical therapy, in addition to the medical care. One should never lose sight of the fact that usually the local condition is one manifestation of a generalized disease, although a monoarthritis based on trauma and a locus minoris resistentiae is occasionally encountered.

During the convalescence of these patients, an elastic bandage or a light cast applied for several weeks frequently permits the synovial membrane to return to normal.

In patients who do not respond to non-operative treatment, synovectomy by a medial parapatellar incision is advised. The hypertrophied synovial membrane of the suprapatellar pouch, as well as the

Fig. 4.
Photograph and x-ray of typical case of gouty arthritis.

Fig. 5.
Tissue removed from knee joint. Upper—degenerated hypertrophied synovial membrane. Lower left—osteophytes. Lower right—degenerated patella.

infrapatellar fat pad and areas of the parietal synovial membrane of the anterior chamber, is carefully resected.[13] If the semilunar cartilages are torn or degenerated, they are excised. If the cartilaginous articular surfaces of the femur, tibia and patella show fibrillation and softening, the portions of degenerated cartilage are carefully shaved off and the surfaces smoothed. Frequently, in such cases, there are large marginal osteophytes. These are chiseled away with an osteotome and the surface smoothed with a rasp. When the patellar groove is badly eroded and the patella is severely degenerated and hypertrophied, the entire patella may be resected. This is done only in selected cases (Fig. 5). In cases of monoarthritis or extensive involvement of a knee joint, arthrodesis may be the best procedure.

In some fixed flexion deformities of the knee joint, the use of wedged casts and turn-buckles (Fig. 6) is important to produce gradual correction. Often heavy elastic bands are used instead of turn-buckles.

HIPS: One of the most common conditions noted particularly in middle-aged patients in an arthritic clinic is malum coxae senilis (Fig. 7A). There is not any medication or physical therapy that will alleviate this condition except analgesics which dissipate the pain to some degree. The simplest therapeutic procedure is arthrodesis, utilizing a long Smith-Peterson nail which enters below the great trochanter and goes through the neck and head of the femur across the acetabulum and deeply into the

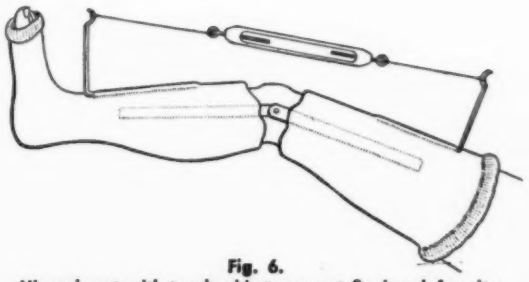


Fig. 6.
Hinged cast with turnbuckle to correct flexion deformity.

ilium. If the condition is unilateral, arthrodesis in the position of election for ankylosis is usually very satisfactory. It is obviously impossible to resort to this procedure when the condition is bilateral, or when the physical condition of the patient does not permit major surgery.

A less certain procedure, but one which has given relief in many cases, is arthroplasty. It is much more formidable than arthrodesis. Fascia lata or a vitallium or plastic cup may be used as an interposing material (Fig. 7B).

The Jones operation of cheilotomy, in which the marginal osteophytes are resected, is condemned because of the frequency with which symptoms persist or recur. When the head is chiseled down to about the same diameter as the neck and the articular portion of the head has a fair covering of cartilage, the prognosis for function and alleviation is somewhat more favorable.

LOWER BACK: Low back pain of arthritic origin must not be confused with that due to other types of derangement such as herniation of an intravertebral disc and the nucleus pulposus, spondylolisthesis, spondylolysis, fibrositis and myofasciitis, ligamentous strain due to poor lumbosacral mechanism (lordosis and horizontal sacrum), metastatic lesions of the lumbosacral region, hemangioma, cauda equina tumors and low back discomfort due to visceral lesions, etc.

The method of treatment of low back arthritis differs for the ambulatory and recumbent patient. The ambulatory patient should be treated by a support which is manifestly indicated by the muscle spasm, which is a protective physiologic mechanism occurring in painful

Fig. 7A.
Malum coxae senilis.

Fig. 7B.
Same patient after vitallium cup arthroplasty.

affections in this area. The pendulous abdomen with its drag on the anterior aspect of the spinal column must be well supported. The support used may be a well-fitting plaster paris cast, brace (9A) or corset (Fig. 9B). Adhesive tape strapping is economical and frequently gives relief in mild low back arthritis. The strapping must be applied generously and should completely encircle the pelvis and lower back, with a towel or layers of sheet wadding, covering the front of the lower abdomen. It has several advantages and a few disadvantages. The advantages are that it is economical, can be applied very securely, remains in place, and is not removed by the patient. The disadvantages are that it precludes the possibility of physiotherapy, and irritation of the skin is produced in certain patients by the long-continued use of adhesive, especially in warm weather.

Physical therapy, consisting of short-wave, radiant heat, light massage, and gentle exercise in the recumbent and vertical positions, is an important adjuvant.

In our clinic physiotherapy of various types was used when it proved comforting to the patient. Stress was put upon simple home-heating devices rather than expensive apparatus.

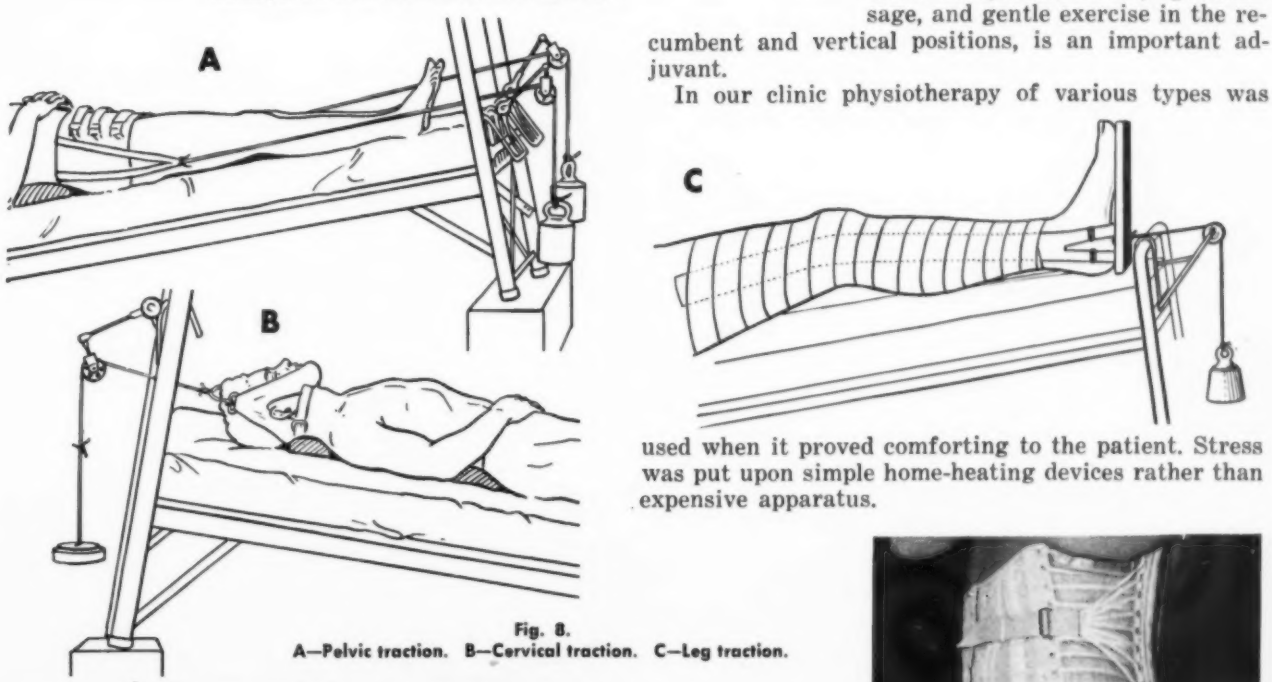


Fig. 8.
A—Pelvic traction. B—Cervical traction. C—Leg traction.

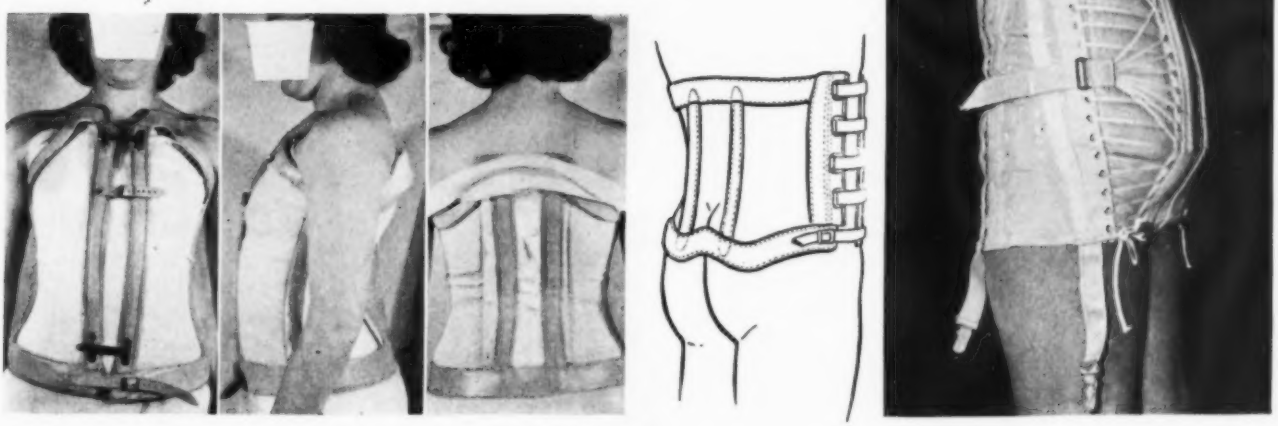


Fig. 9.
Above—Duralumin brace for back support. Right—Corset with rigid stays.

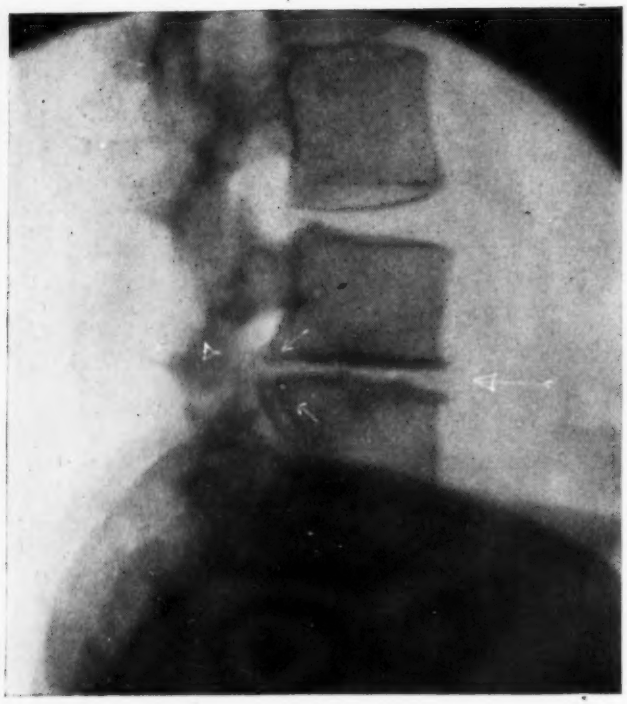


Fig. 10.
Roentgenogram showing narrowing of the fourth disc space with sclerosis of the margins, and posterior, as well as anterior, osteophytes.

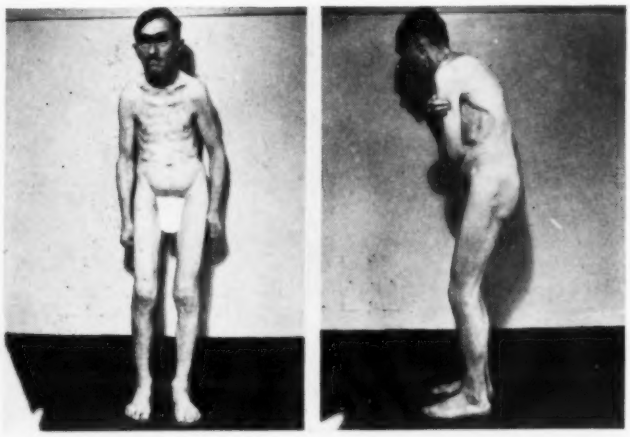


Fig. 11.
Above—Ankylosing spondylitis. Note severe forward flexion of the spine, emaciation and angulation of the ribs.

Right—Roentgenogram showing ossification of the anterior longitudinal ligament.

The bed of the patient must be altered with the single objective of producing maximum comfort. While, we have usually advocated a rigid mattress, it has been found in selected cases that an extremely soft bed gives some patients greater comfort. The relief of the spasm during recumbency at night often manifests itself by better function and less spasm during the day. It is better for the patient to apply the corset or brace while in a recumbent position before leaving the bed. Still more recently, a bed fitted with a back rest and a device for keeping the knees and hips flexed has been advocated. The patient is recumbent in a modified sitting position.[14] This position cannot be employed for a long period of time, particularly when ankylosis is impending, since a fixed flexion deformity of the hips and spine may result.

Another method of treatment of low back pain in arthritis is by the use of x-radiation, according to the method of Smyth, Freyberg and Peck.[15] The improvement or alleviation of discomfort after four to six treatments is sometimes striking.

Fig. 12.
Blow bottles used to increase vital capacity.

Fig. 13.
Simple cervical collar of felt re-inforced with aluminum stays and webbing straps.

The patient with severe arthritis of the lower back should be treated by recumbency, pelvic and leg traction (Figs. 8A and 8C), physical therapy, consisting of short wave, radiant heat and massage once daily, in addition to which the patient is placed in the prone position with a pillow under the abdomen twice daily and a simple therapeutic baker is used for 40 minutes. For those patients who are treated at home, such simple physical therapy methods as designed by Treusch and Krusen[16] may be used. This area may frequently be painted with warm melted paraffin as a means of producing prolonged heat.

Severe localized arthritis of the lumbosacral region with evidence of disturbance of the articular surfaces of the facets and evidence of degeneration of the disc with marginal osteophytes (Fig. 10) is best treated by a fusion operation. The writer prefers the method combining the essential features of the Albee and Hibbs procedures.

ANKYLOSING SPONDYLITIS: In the Marie-Strumpell type of arthritis (Figs. 11A and 11B), blowbottles (Fig. 12) are used to increase the vital capacity, and cervical (Fig. 8B) as well as pelvic traction and gradual hyperextension on a firm bed with the elimination of pillows are employed.

CERVICAL ARTHRITIS: Cervical arthritis is very common. The degree of pain associated with it is not directly proportional to the extent of arthritis visible in the roentgenograms. It is the marginal periostitis rather than the marginal osteophytes which cause the radicular types of pain so frequently found in this region and so frequently confused with brachialgias from other sources, such as the scalenus anticus syndrome and myofasciitis of the trapezius and supraspinatus regions.

For the ambulatory patient, a very simple cervical collar (Fig. 13) is used. This collar and the physical therapeutic measures described for lower back derangement give good results. Cervical traction may be used in either the vertical or horizontal position (Fig. 8B). The most severe cases require a Minerva type of cast.

HANDS: One of the most important factors in the treatment of arthritis involving the hands is the prevention of disabling deformities so frequently occurring in atrophic arthritis (Fig. 14). The flexion of the metacarpophalangeal joints may go on to com-

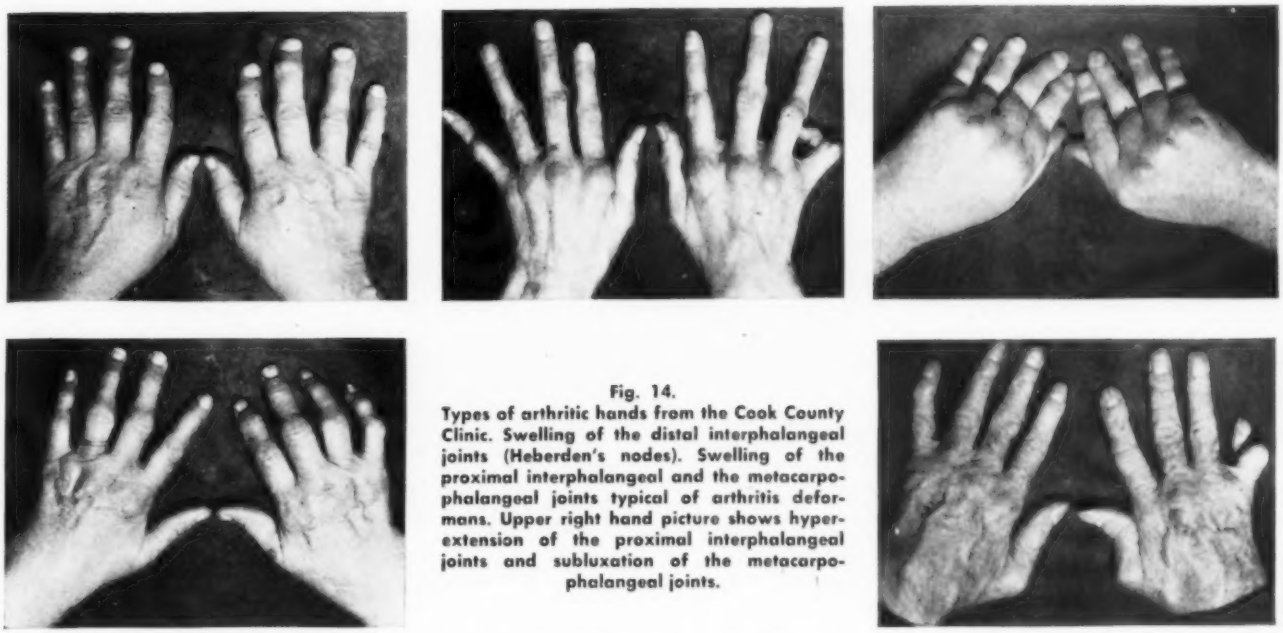


Fig. 14.
Types of arthritic hands from the Cook County Clinic. Swelling of the distal interphalangeal joints (Heberden's nodes). Swelling of the proximal interphalangeal and the metacarpophalangeal joints typical of arthritis deformans. Upper right hand picture shows hyperextension of the proximal interphalangeal joints and subluxation of the metacarpophalangeal joints.

plete subluxation. Hyperextension of the proximal interphalangeal joints, coupled with deformity of the thumb, frequently gives more or less complete loss of the prehensile function of the hand. Paraffin baths, radiant heat, massage, gentle exercises and curative occupational therapy are important in the local treatment.

A banjo splint with fine stainless steel pins through the pulp of the fingers anteroposteriorly, attached by rubber bands to the banjo, helps to correct severe deformities. Adhesive straps or "finger traps" may be used instead of the pins.

the emotional instability was a pre-existing factor. Obviously, the type of therapy would be different, depending upon what caused or influenced the emotional instability.

It has been noted in this clinic that, as the physical state of the patient improved, in most cases the emotional disturbances gradually disappeared. Throughout the course of treatment, with the help of the Social Service Department, everything possible was done to relieve the patient's economic problems, to correct home conditions and lessen mental and physical strain.

Patients with complicating or concomitant diseases,

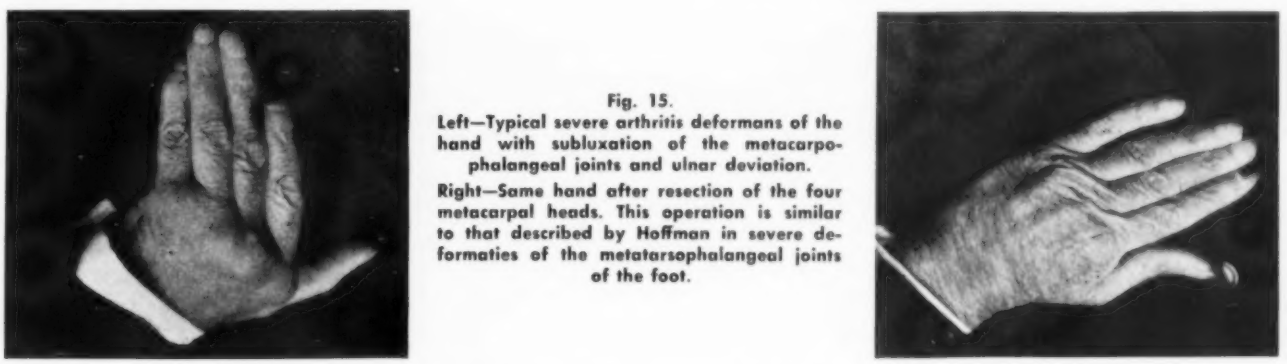


Fig. 15.
Left—Typical severe arthritis deformans of the hand with subluxation of the metacarpophalangeal joints and ulnar deviation.
Right—Same hand after resection of the four metacarpal heads. This operation is similar to that described by Hoffman in severe deformaties of the metatarsophalangeal joints of the foot.

In very severe cases of permanently disabling, residual deformities of the fingers, resection of the metacarpophalangeal heads, as described by the senior author in 1928 before the Clinical Orthopedic Society, is indicated (Fig. 15).

WRISTS: Flexion deformity of the wrist produced by arthritis must be prevented or corrected as it interferes with the grasping function of the hand.

Medical Management

AFTER the establishment of the diagnosis and completion of the general inventory of the patient's mental and physical status, a definite plan of procedure was outlined for each patient.

The patients found most difficult to manage were those who had mechanical, irreparable defects of the joints and those with exceptional emotional instability. In the latter group, it was important to determine whether the emotional instability was, in part, induced by long protracted periods of pain and disability resulting from arthritis inadequately treated, or whether amenable to therapy, were given the necessary treatment or referred to other special clinics with suggestions for management.

An effort was also made to see that each patient received the optimum diet, including adequate amounts of all the essential vitamins and minerals. High-caloric diets were prescribed for those patients who were under normal weight. Low-caloric diets and other methods of weight reduction were prescribed for those arthritic patients who were overweight, particularly when the weight-bearing joints were involved. Two of the patients in our series had cholecystitis. There is a possible relation between the chronic cholecystitis and the patient's arthritis, since cholecystitis is an infectious process.

In any discussion of arthritis, gold therapy must be mentioned. A few of our patients received weekly myochrysine injections. No untoward reactions were observed. However, in general, it is agreed that gold therapy is more advisable in cases of pure rheumatoid arthritis than in any other form. Approximately 48%

showed some improvement.[5] All authors agree as to the dangers of toxic reactions. Most of these are exfoliative dermatitis[6] and other skin lesions. Other toxic manifestations are kidney damage, and encephalopathy apparently due to brain hemorrhages.[7]

All of the patients who had had arthritis for two years or longer, prior to their entrance to the clinic, were given heat-vaporized electrically-activated ergosterol.*

In most cases three capsules of vitamin D (Whittier process), containing 50,000 U.S.P. units, were given, one after each meal. The dose was then gradually increased until six capsules per day were given. A procedure, found to be very satisfactory, is as follows:

1st three days—3 capsules, one after each meal.

4th to 6th day—4 capsules, one after each meal and one at bedtime.

7th to 9th day—5 capsules, one after each meal and two at bedtime.

Thereafter: six capsules daily (300,000 units).

After improvement had been noted for some time, the dose was gradually decreased. Earlier cases of arthritis responded rapidly but the cases of long duration often responded much more slowly. In some, beneficial results were obtained in from three to six weeks, while in others there was no demonstrable effect until after three months.

Effect of Massive Doses of Vitamin D on Blood

THE blood of each patient was studied before therapy was instituted and then at six-month intervals after treatment was started.

CALCIUM: It has been known for many years that vitamin D plays an important role in the absorption and utilization of calcium. Earlier investigators, using preparations of vitamin D which were contaminated with such intermediate products as tachysterol and toxisterol, often observed hypercalcemia or other serious toxic effects. It has been shown that when preparations containing these intermediate products are administered in the dosage necessary to treat arthritis adequately, untoward results may occur.[8] In our patients no persistent cases of hypercalcemia developed. In this series of 164 patients, the average level of blood calcium before therapy was 9.69; after six months of therapy, 10.32; after 12 months of therapy, 10.18. There were only eight cases with blood calcium levels over 12 milligrams after six months of treatment. Of these, all but one returned to normal levels during the next six-month period of treatment. In those cases in which the calcium level rose above 12 milligrams, the drug was withheld for one week and then administered in a slightly reduced dosage. After the patient had received this dosage for a period of three weeks, another blood calcium determination was made. As previously stated, in all cases but one under this regime the calcium returned to normal levels even though the administration of activated ergosterol (Whittier process) was continued.

The graph shows the average of the calcium levels in the arthritic patients before treatment, after six months of treatment and after 12 months of treatment. Because many of the patients have returned to full-time work, it was not possible to obtain the 12-month determinations in all patients. Of special interest is the fact that *before* treatment, a patient who showed no clinical symptoms other than those of chronic arthritis, had a calcium level of 14.5 mgm. After six months on Ertron, her calcium level was 10.3 mgm.

*Ertron, prepared by the special Whittier Process and standardized so that each capsule contains 50,000 U.S.P. units of vitamin D.

We found no correlation between the blood level of calcium and the progress of the disease or response to therapy. Our findings are in accord with those of earlier investigators.

Snyder and Squires,[9] who have had very extensive experience with this form of treatment, have found that there exists no correlation between hypercalcemia and symptoms of toxicity. They have pointed out that hypercalcemia frequently exists without any signs of intolerance and symptoms of intolerance may occur without hypercalcemia. A careful study of the blood findings in our patients corroborated these views.

McLean[10] stated: "Moreover, it is a matter of common observation, both in dogs and in man, that there is no absolute correlation between the calcium level and the severity of other toxic manifestations in hypercalcemia."

The findings of Reed[11] and Hathaway[12] corroborate these views.

PHOSPHORUS: There was no significant change in the phosphorus content of the blood. Before therapy was administered, the average for this group of patients was 3.62. After 12 months of treatment the average was 3.3 (Graph).

NON-PROTEIN NITROGEN: The mean N.P.N. value before treatment was 37, and after the course of therapy, 36 (Graph). We saw no clinical or laboratory evidence of genito-urinary tract damage.

Toxicity or Intolerance

NO TRUE toxicity was manifested in any patient receiving electrically activated ergosterol. Twenty-one experienced anorexia, nausea or occasional polyuria and nocturia. One of the patients had a gastric ulcer and two had pyuria, which may have accounted for these symptoms. Several of the patients who had nocturia had had this symptom prior to the use of the heat-vaporized electrically activated ergosterol. There was no impairment of renal function which might have been attributed to the action of this preparation.

Results

AT THE Arthritis Clinic of the Cook County Hospital, more than 300 patients, afflicted with chronic arthritis, have been treated during the past 18 months. Of these, 164 were treated for more than six months and form the basis for this report. Seventy-eight were males and 86 were females.

In our series of 164 cases treated by the method herein described, no attempt was made to select any particular type of arthritis or any definite age group. The ages varied from eight years to 82 years.

Some patients showed the first signs of improvement as early as three weeks after treatment was started, while in others there was no demonstrable effect until after three months.

One of the outstanding benefits derived from this type of therapy was the increased sense of well-being after the preparation had been used for a period varying from a few weeks to a few months.

The criteria which we used for measuring the degree of improvement are as follows:

1. Relief of pain.
2. Improved function of affected joints.
3. Improved sense of well-being.
4. Improved muscle strength as tested by dynamometer.
5. Ability to return to work.
6. Diminution in soft tissue swelling. This occurred in some instances, but otherwise the roentgenographic findings of the affected joints were unchanged by the medical treatment.

According to these standards, of the 164 patients

treated, 12 (7.3%) showed no improvement; 27 (16.6%) slightly improved; 51 (31.3%) moderately improved; 65 (39.6%) markedly improved and nine (5.5%) cured. Thus, it is seen that approximately 93% of the patients in this series were definitely improved.

Discussion

IN EVALUATING the results obtained in this clinical investigation, it was important to keep in mind the fact that this was primarily a *treatment clinic*, as contrasted to other special research clinics.

It is obvious that in research clinics in which a patient receives the benefit of only one therapeutic agent, the results will not be as good as those obtained in a treatment clinic such as ours in which the patient receives the benefit of not only a particular remedy which is being studied but, in addition, such other therapeutic measures as will either hasten the recovery or help alleviate the symptoms.

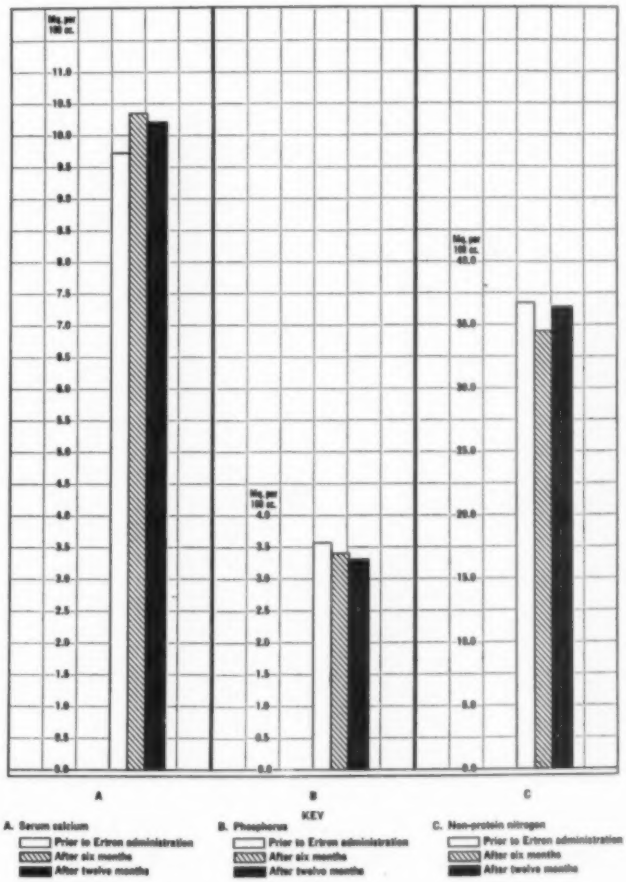
Freyberg[17] also conducted a study of various types of vitamin D. His primary purpose was not to bring improvement to a given number of patients but, rather, to study the mode of action and comparative toxicity of these products. Under such conditions his percentage of improved cases was obviously smaller than that reported by clinicians whose main interest was to bring about recovery of the patient. Even in this study Freyberg reported that in 36 cases of rheumatoid arthritis treated with Ertron he obtained subjective improvement in 14 and objective improvement in six. In evaluating these results, it must be pointed out that of the 45 courses of treatment only 14 patients received the recommended 300,000 units daily.

Freyberg further demonstrated that this improvement was not psychogenic. He reported: "Improvement, when it occurred with Ertron therapy, was much more often subjective than objective, and not infrequently patients would state that they felt better in general, 'had more pep' and had less indigestion and constipation, although improvement in rheumatic symptoms was not especially noted. We wished to determine how much of this improvement might be psychogenic; to test this we preceded Ertron treatment with the administration of capsules of lactose which looked exactly like Ertron. This placebo was given for one or two months in a manner just like Ertron therapy and then Ertron capsules were given, care being taken that the patients did not know of the change. It was noticed that improvement seldom occurred during the administration of the placebo and when observed it was relatively slight. By this criterion, benefit seen during Ertron therapy must only seldom be psychogenic."

Most of the patients treated in the Cook County Hospital clinic had been under observation and had failed to respond to many other forms of therapy prior to being accepted for this investigation. Among these previously tried forms of therapy may be mentioned surgical or medical removal of foci of infection in the teeth, tonsils, sinuses, genito-urinary organs, prostate, gall-bladder and appendix. Many patients tried bed rest, orthopedic surgery and appliances, physiotherapy, spa therapy, gold vaccines, fever therapy, analgesics, including the salicylates, colonic irrigation, bee venom and special diets.

After progressive failure, in spite of these forms of treatment, some patients resorted to care by cultists and others were resigned to a life of invalidism. The psychic trauma thus inflicted needed special attention.

Of extreme importance also was the high incidence of pathologic conditions other than arthritis. Those most commonly requiring treatment were anemia, reduced or absent gastric acidity, disturbed gall-bladder



and liver function, gastric and duodenal ulcers, dietary deficiencies, arteriosclerosis, varicose veins, neuritis, faulty body mechanics, diabetes, tuberculosis, lues, and Neisserian infection. These all required special care other than that directed against the arthritic lesions. Each patient was treated as a separate problem.

No signs of serious toxicity were encountered. Occasional nausea, anorexia or nocturia occurred which may have been due to intolerance to the drugs used or to previously existent pathology in the gastro-intestinal tract, such as achlorhydria, cholecystitis, gastric or peptic ulcer or dietary indiscretions.

Summary

THIS report describes the results obtained in a series of 164 cases of chronic arthritis treated in the Arthritis Clinic of Cook County Hospital.

2. The orthopedic management of arthritic patients is described and the indications for each type of arthritic manifestation are briefly outlined.

3. The medical management of these patients included general hygienic measures, correction of dietary deficiencies and routine medication including electrically activated ergosterol.

4. During this course of treatment, there was no significant change in either the calcium, phosphorus or non-protein nitrogen.

5. No true toxicity occurred in any of the patients.

6. By our methods of treatment, we were able to produce beneficial results in 93% of the cases which could be followed.

7. No specificity is claimed for Ertron therapy. However, any substance which is non-toxic and which by its general systemic action does produce improved sense of well-being, diminution of soft tissue swelling, relief of pain, and improved muscle strength, and which does make possible a return to gainful occupation, should be used in the treatment of arthritic patients.

Bibliography

1. Nissen, H. A.: Chronic Arthritis and Its Treatment. *New England J. Med.*, 210:21, pp. 1109-1115, May, 1934.
2. Block, W. D., Buchanan, O. H., and Freyberg, R. H.: Serum Lipids in Patients with Rheumatoid Arthritis and in Patients with Obstructive Jaundice. *Arch. Int. Med.*, 68-18, July, 1941.
3. Pemberton, R., and Scull, C. W.: Nutritional Aspects of the Treatment of Arthritis. *Am. J. M. Sc.*, 201:250, February, 1941.
4. Levinthal, D. H., and Logan, C. E.: The Orthopedic and Medical Management of Arthritis. *Journal-Lancet*, 63:48, February, 1943.
5. Snyder, R. G., Traeger, C. H., and Kelly, L. C.: Gold Therapy in Arthritis; Observations on 100 Cases Treated with Gold Sodium Thiosulphate and Aurocein. *Ann. Int. Med.*, 12:1672, April, 1939.
6. Cecil, R. L., Kammerer, W. H., and DePrume, F. J.: Gold Salts in the Treatment of Rheumatoid Arthritis; A Study of 245 Cases. *Ann. Int. Med.*, 16:811, May, 1942.
7. Snyder, R. G., Traeger, C. H., and Squires, W. H.: Toxic Reactions and Death Following Gold Therapy in Chronic Arthritis. *Industrial Medicine*, 11:425, September, 1942.
8. Tumulty, P. A., and Howard, J. E.: Irradiated Ergosterol Poisoning. *J.A.M.A.*, 119:233, May 16, 1942.
9. Snyder, R. G., Squires, W. H., Forster, J. W., Traeger, C. H., and Wagner, L. C.: Treatment of Two Hundred Cases of Chronic Arthritis with Electrically Activated Vaporized Sterol (Ertron). *Industrial Medicine*, 11:295, 1942.
10. McLean, F. C.: Activated Sterols in the Treatment of Parathyroid Insufficiency—A Review. *J.A.M.A.*, 117:609, August 23, 1941.
11. Reed, C. I., and Seed, L.: The Treatment of Clinical Tetany with Irradiated Ergosterol. *J. Nutrition*, 6:371, 1933.
12. Hathaway, M. L., Rappaport, B. Z., Reed, C. I., and Struck, H. C.: A Study of Blood Constituents in Pollinosis With and Without Treatment. *J. Allergy*, 8:1, 1936.
13. Levinthal, D. H.: Surgery of Derangement of Knee Joint. *Surg. Clin. North America*, pp. 181-203, February, 1943.
14. Breck, L. W., and Basom, W. C.: The Flexion Treatment for Low-Back Pain: Indications, Outline of Conservative Management and A New Spine-Fusion Procedure. *J. Bone & Joint Surg.*, XXV:58, January, 1943.
15. Smyth, C. J., Freyberg, R. H., and Peck, W. S.: Roentgen Therapy for Rheumatic Disease. *J.A.M.A.*, 116:1995, May 3, 1941.
16. Treusch, J. V., and Krusen, F. H.: Follow-Up Study of Physical Therapy Applied at Home for Arthritis. *Proc. Staff Meet. Mayo Clinic*, 17:524, October 7, 1942.
17. Freyberg, R. H.: Treatment of Arthritis with Vitamin and Endocrine Preparations. *J.A.M.A.*, 119:1165, August 8, 1942.

New Horizons in Industry

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THOSE hardy adventurous souls who first explored the vast territory of our country knew a zest and inspiration in their living which, some say, has gone from our lives since the geographical frontier disappeared.

Some of that spirit has gone but it can be recovered. There are new frontiers. They are in a different realm, however. They consist in bringing to the service of all men the best that scientific exploration and experience had taught us. They lead to that better world for which we fight in this present war. They exist in every profession.

Such a frontier is to be found today in the great field of industrial vision. There is much to be learned and applied. It is an open invitation to bold men of good will everywhere. It does not require real sacrifice from anyone, as many men are discovering.

What is the basis for this declaration? It grows out of the experience gained in establishing a vision program for thousands of employees and in dealing directly with the visual problems of people at their work stations.

The program began during the war emergency with the problem of placing applicants at work which their visual skills permitted them to do successfully. It arose from the failure of more than 20% of new employees on one job to learn that job, plus the fact that a screening test indicated poor work-point vision. At that particular point professional help was obtained.

Today, from a study soon to be published, it seems clear that success in operating five major types of machines is definitely related to specific patterns of visual skills. This is not the place for a detailed statement of that study. The major implication is important. It is that *maintaining and rehabilitating* vision for the job has dollars-and-cents value for industry and business. It is a service which is bound to be accepted more and more as essential for efficient production. But there is much to be learned and much educating to be done before wide-spread success is achieved.

Some of the problems to be met can be recognized today. For one thing, it is clear that many people seek visual corrections but do not obtain those which contribute to comfort and efficiency on the job. A partial but salient reason in many cases is that industry has not made accessible to the eye specialist the special requirements of specific jobs. For example, he has had no way of knowing that certain types of bifocal lenses are wholly unsuited to certain drill press jobs. Studies are under way throughout the country which will make more of this data available in the near future. It is not too much to say, however, that there is no substitute for full knowledge of the worker's job. Somehow industry must make it possible for the professional man to get into the factory to see employees at work.

Significant here is our experience that 75% of our potential presbyopes did not have a suitable correction for ordinary purposes at the time they were given thorough eye examinations by the staff of our Eye Service Section. These are the highly skilled men with the "know how" to get out vitally needed production and they will not be drafted. This is a challenge to the profession. If vision is related to production, the output of these men is below its potential. Why is it so many of these men lacked suitable corrections? Are they expecting a given correction to serve too long? Do they know how much poor vision contributes to anxiety and worry, and possibly detracts from their general good health? Do they understand its relationship to accidents? Does the cost of adequate eye care seem excessive to them? Have they had bad luck when they sought new glasses? From talking with these men there is reason to believe that each of these questions suggests a condition to be remedied. The professional man will benefit as an increasing proportion of presbyopes secures adequate corrections. How to get it done is the challenge.

Another problem, the solution of which will have its appeal for some men, is that of relating clinical findings to the particular patterns of visual skills best suited to certain jobs. We will always encounter some persons who are successful but whose vision does not meet the standards in every respect. These persons are valuable to industry and they also deserve the right to make their contribution to the common good. How shall the examining physician in the employment office be instructed so that this type of applicant will not frequently be turned away?

THAT leads to another consideration. It is reasonable to suppose that most industrial establishments are unlikely for the present to be convinced that they can pay for a thorough eye examination when it must be made periodically in order to maintain vision for the job. There is an additional cost involved, that of the loss of production during examinations given on company time. Solutions to these problems will probably be of two kinds, possibly a greater use of valid screening tests, and the training of technicians to

give specialized portions of the necessary full examination so that the optometrist or ophthalmologist obtains valid data for a diagnosis but in less time. Improving and devising these techniques will have their appeal.

For the time being, some concerns will find it economical and otherwise advantageous to employ their own staffs of eye specialists. Many concerns will not be able to follow this plan but will be in as great need of the service. They will need to make arrangements with local eye specialists on a basis mutually satisfactory to the concern and professional men.

There is still much to be said. The visual aspects of a successful safety program have not been mentioned. It should not be overlooked that management is most likely to accept an eye care program if it stresses eye protection. Still another field open to detailed investigation is the relation of vision to accident proneness in industry. Many persons require corrections before they can wear safety glasses when they are needed. Consequently a safety program cannot survive without a corrective program. Illumination can be improved on many jobs to the advantage of all concerned. Redesigning machines offering poor visibility should be considered. "Three-dimensional seeing" through the use of contrasting colors on machines is a field for specialization. Accessories can be used safely and more widely in many instances to improve visibility but they need to be *fitted to the individual* who is using them. The vision of many persons can be improved with training, but we face the job of getting that done efficiently on or off the job. All these must be combined into a total effective eye care program.

Other illustrations are hardly needed to point out what can be done and what needs to be done. It will be done. The time will come and the means will be found to maintain adequate vision for the great proportion of persons for whom it is a potential.

Furthermore, through the medium of a sound safety program, countless tragic eye accidents as well as accidents due to defective vision will be avoided, conserving the manpower of the nation and maintaining the morale of the individual. Progress toward these goals, as well as the redirection of effort, depends upon the cooperation of all the professions intrinsically responsible for eye care. And it will be an exhilarating and worthy experience to all who contribute to the achievement of this purpose.

The Topography of Pins

—Precision Pinning of Fractures—

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Paris, Illinois

EXTERNAL skeletal fixation of fractures has been definitely demonstrated as a sane and rational approach to many problems in fracture therapy. This advance has made early ambulation of the patient feasible and possible, thus removing the need of long bed rest and hospitalization.

Reviewing some of the disappointments and failures in the use of this great advance toward the solution of fracture problems, the foundation of this work offers the answer to many of the difficulties. Certainly the pins used in securing the fixation units constitute the foundation. Naturally it becomes essential to know the preferred pin sites and a careful technique for inserting the pins. The early studies of Anderson, and his continuous valuable contributions to this work, have pointed out definite pin sites with due consideration for the most substantial anatomical support as well as consideration for vital structures such as blood vessels, nerves, etc. He also demonstrated these various pin sites by careful anatomical cross-section studies. This work has for its object a more detailed study of these pin sites, attempting to bring the actual work before the reader.

Without mentioning specific fractures, or going into their classification, the technique of inserting pins as it relates to the external fixation of fractures will be discussed. A standard group of pin sites has been selected and a combination of these may be used for the treatment of any long bone fracture in average adults, varying only for extremely fat patients and children. A special study should be made of the topography of pins with respect to all epiphyses before attempting to use skeletal pinning and external fixation in children.

Certain general principles should first be outlined before proceeding with the location of the various pin sites. Precision pinning brings a much higher average of good results, shortens the anesthesia, increases the surgeon's skill, enables him to insert pins accurately, and lessens the use of x-ray.

All unnecessary pressure must be dispensed with, whether it be pressure on the skin, fascia, muscles or bone. Not only is it necessary to have the pins correctly inserted in the bone, but it is also necessary to have the patient held in a neutral position when the pins are being inserted; i.e., if pins are inserted through the deltoid into the proximal humerus while the arm is held in abduction at right angles from the body, then when the patient is ambulatory and the arm is carried at the patient's side in adduction, these pins will travel through the surrounding structures and skin for a distance of approximately one to one and one-half inches. Considerable drainage will take place until this pressure is eventually relieved by absorption of tissue. This may be avoided by the patient being in a correct position while the pins are inserted. Temporary pressure such as may be created by the patient raising his arm is of no particular concern, as the arm is never kept in this position for any length of time and therefore no absorption occurs.

The less soft tissue involved between the bone and the skin, the less friction on the pins, thus allowing the external support to be attached much closer to the bone. A pin never bends in the bone, but just where it enters the cortex, therefore the less the distance between the skin and the bone the less danger of travelling pins and drainage.

To assure correct placement of pins and to avoid creating pressure in soft parts one must know the correct position to enter the skin and the bone. When entering the skin, the pin must be directed straight to the correct position in the bone, thus avoiding pressure that may be created by changing direction.

SKELETAL PRESSURE MAY BE DISCUSSED IN THE FOLLOWING DIVISIONS:

(A)—Any Steinmann pin or nail driven into the bone by a mallet or hammer will create local pressure, causing a pressure necrosis. This bone will absorb, the hole becoming much too large, causing the pin to loosen.

(B)—A threaded screw that has been inserted into the bone after the bone has been drilled and tapped will result in absorption of bone when the surgeon tightens it up after the head of the screw comes in contact with the bone, thus leaving the screw loose.

(C)—When a tapered screw is used, the pressure is increased as the screw is driven, and pressure necrosis takes place followed by absorption.

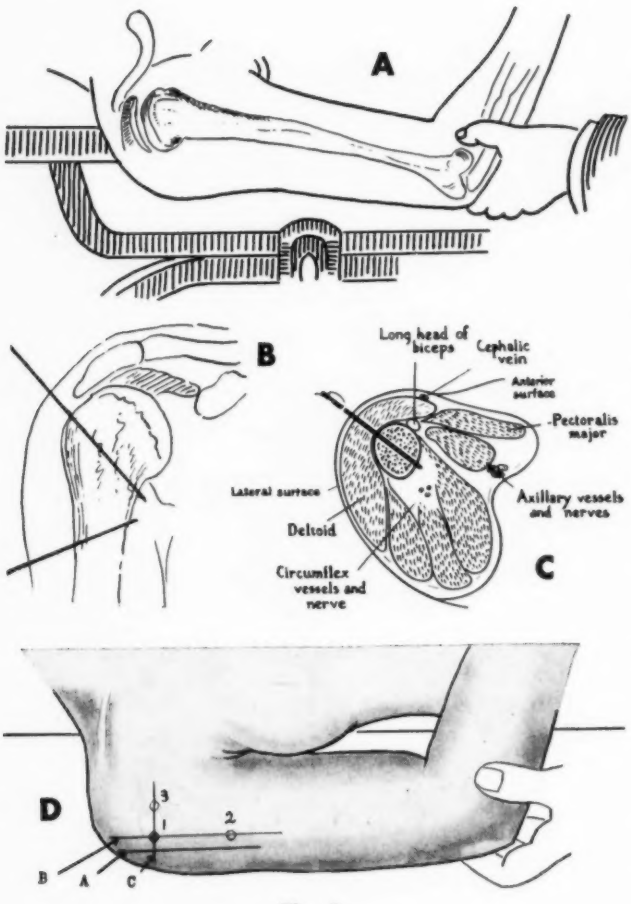


Fig. 1.
Proximal Humerus

(A) The assistant supports the arm by securely grasping the condyles of the humerus and exerting traction.
(B) The arm as viewed in anterior posterior position with upper pins in place.
(C) Cross section of humerus near insertion of upper pin.
(D) Palpate bony landmarks and draw lines. By reference to text the pin sites can be clearly located in this drawing.

(D)—If pins, screws or bands are placed around the fracture site, tremendous pressure is created by leverage. This may be minimized by gaining skeletal fixation as close to the articulating surfaces as possible, and when the adjacent long bone is used for fixation it is sometimes advisable to support both the proximal and distal ends to disperse the leverage.

(E)—Pressure may be minimized by dividing it over a greater area; i.e., a transverse pin has one-third less bearing surface than an oblique pin. A pin inserted across the condyle of the femur has a much greater bearing surface than a pin in the shaft and, although the cancellous bone is softer, it has a much better blood supply, so therefore a size larger pin may be used.

The first pin of any unit to be inserted is the pin closest to the articulating surface, starting close and directing it away from the articulation. The same technique is employed relative to nerves and vital organs if a pin is to be inserted close to them.

The question of measuring by fingers or by a definite measurement has often been raised. Of course, there is some variance in size of fingers and it has not been determined what an average size for a finger is. However, with the application of a little practical consideration in dealing with a very small or very large fingered individual, making allowance for same, no difficulty should occur. There is much in favor of using the fingers. Working in a sterile field with gloved fingers, it dispenses with various measuring devices. The fingers are pliable and conform to the soft structures more accurately than some metal object. Fingers are always available. There is a decided advantage in the tactile directional function of the fingers.

All reference to directions has been taken from the normal anatomical position. The correct positioning of the extremity and locating of the pin sites follow:

Proximal Humerus—Fig. 1

THE PATIENT is to be placed with his shoulder over the table while the assistant applies traction by firmly grasping the epicondyles with the arm flexed at a right angle with forearm lying toward the body and elbow one hand's breadth from the body.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—A line six inches in length drawn from the center of the acromion process toward the lateral epicondyle.

Line B—A line paralleling Line A one inch anterior.

Line C—Bisects Lines A and B one thumb's breadth distal to the acromion process.

PIN INSERTIONS:

Pin No. 1 enters the skin where Line B is bisected by Line C and is inserted in a medial-posterior, distal direction, passing obliquely across the shaft protruding one-fourth inch beyond the opposite cortex.

Pin No. 2 enters the skin on Line B four fingers distal to pin No. 1 and is inserted in a medial-posterior, proximal direction, passing obliquely across the shaft emerging from the medial cortex one-half inch distal to pin No. 1, protruding one-fourth inch beyond the cortex.

Pin No. 3 enters the skin on Line C over the anterior surface of the head of the humerus as designated by the x-ray and is inserted posterior, passing transversely through the head and projecting one-fourth inch beyond. *Pin No. 3 is only used when pin No. 2 involves the fracture site and is used in conjunction with pin No. 1.*

X-Ray—If x-ray is used to assure accurate placing of pin No. 3, a metal skin clip may be placed on Line C over the center of the anterior surface of the head of the humerus and, by taking an A.-P. view with the tube centered over this skin clip, the exact position to place the pin will be indicated.

Distal Humerus—Fig. 2

THE PATIENT is moved toward the opposite side of the table, flexing the arm at right angles with forearm placed transversely across the chin of the patient. The assistant stands on the opposite side of the table, taking hold of the hand or wrist to counteract any pressure that may be exerted by drilling. He places his hand on the forearm three fingers distal to the ante-cubital crease, using this as a fulcrum to create traction on the humerus.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—A line six inches in length drawn from the lateral border of the olecranon proximally, over the true posterior aspect of the humerus.

Line B—A transverse line drawn between the epicondyles.

PIN INSERTIONS:

Pin No. 1—enters the skin on Line A three fingers proximal to the tip of the olecranon or one finger proximal to the transverse line B and is inserted in an anterior-proximal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Pin No. 2—enters the skin on Line A three fingers proximal to pin No. 1 and is inserted in an anterior

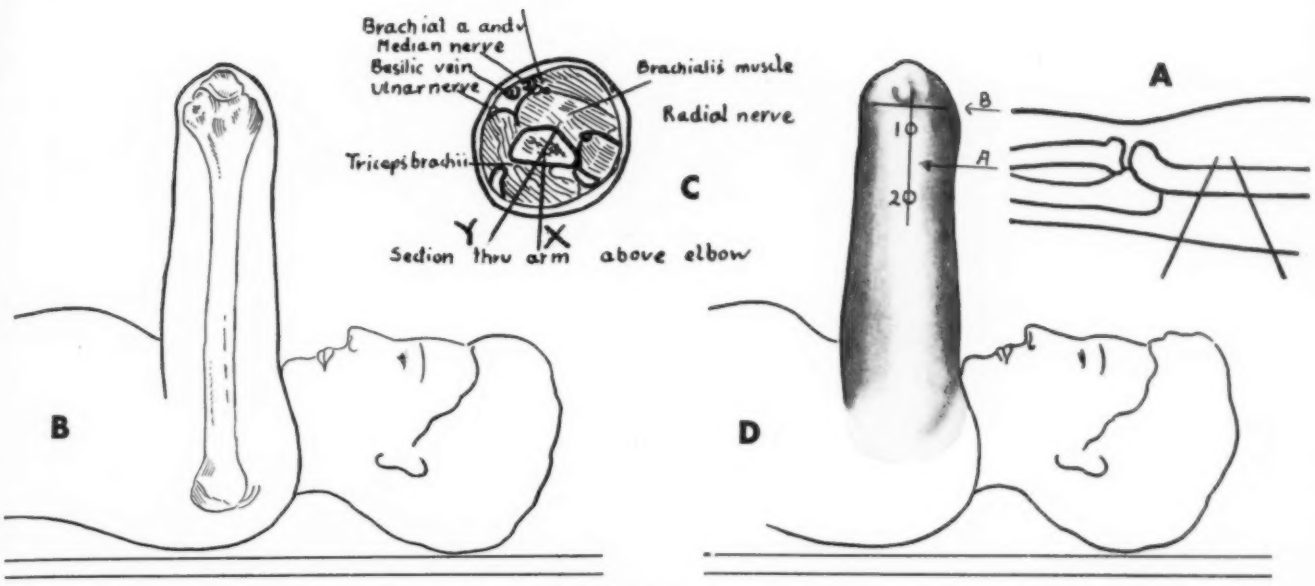


Fig. 2.
Distal Humerus

(A) The positions of the pins of the distal humerus are shown in the lateral position.
(B) The position of the humerus as viewed by the operator for distal humerus pins.
(C) Cross section through humerus above elbow. The position of pins described in text is indicated by "X."
(D) Palpate bony landmarks and draw lines. The pin sites are indicated by the numerals "1" and "2."

distal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Proximal Ulna—Fig. 3

THE ARM to be placed on an arm-board with elbow flexed at right angles with the transverse axis of the elbow vertical to the floor with palm down.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—A line drawn six inches in length over the lateral aspect of the ulna from the tip of the olecranon distally.

PIN INSERTIONS:

Pin No. 1—enters the skin on Line A three fingers distal to the tip of the olecranon and is inserted in a medial-distal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Pin No. 2—enters the skin on Line A three fingers distal to pin No. 1 and is inserted in a medial-proximal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

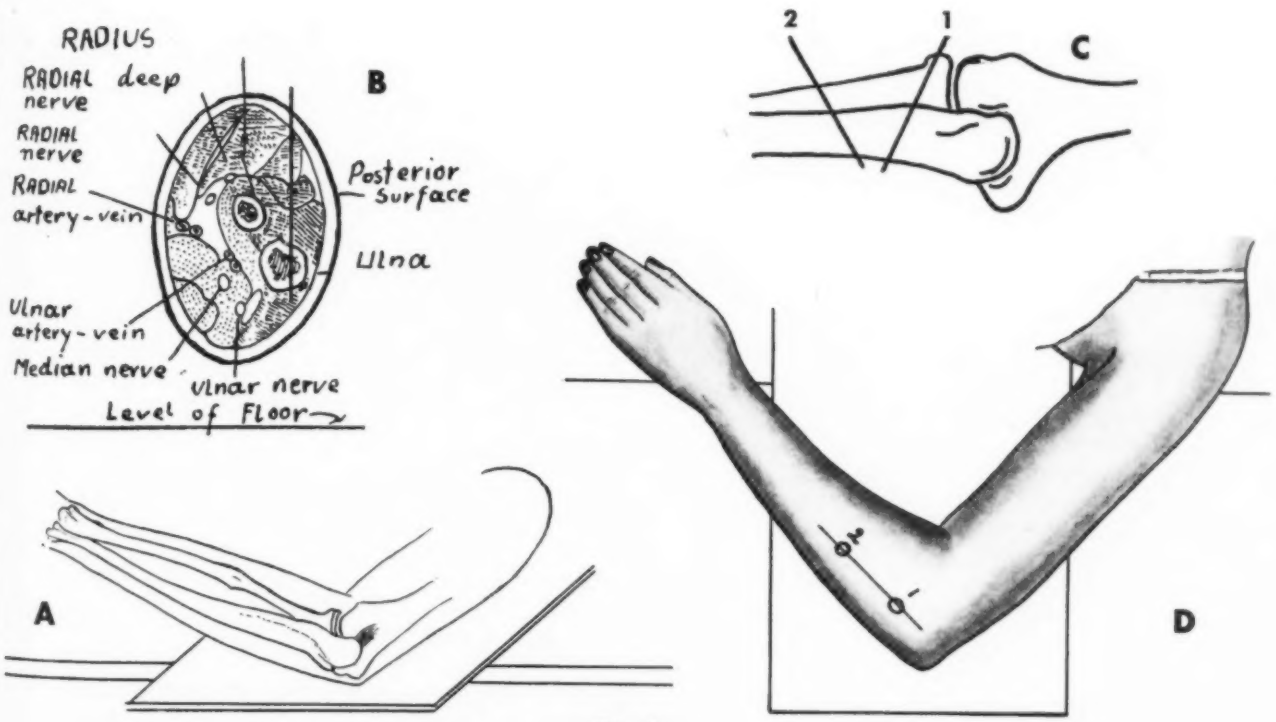


Fig. 3.
Proximal Ulna

(A) Lateral view of proximal ulna position as described in text.
(B) Cross section through forearm indicating location of pins in proximal ulna.
(C) A lateral view of pins in situ.
(D) Numerals "1" and "2" indicate the pin sites of proximal ulna.

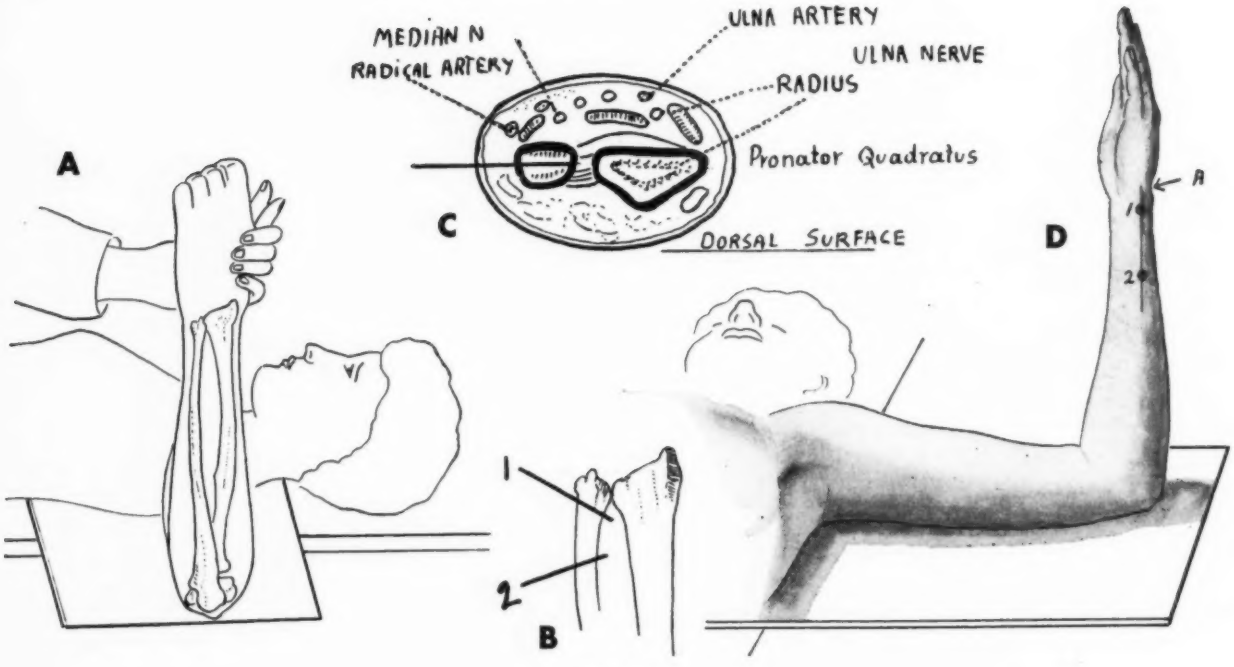


Fig. 4.
Distal Ulna

(A) This is a posterior anterior position of distal ulna. (B) This is a posterior anterior position of pins in situ. (C) A cross section just above distal radial-ulnar joint. The relation of pin to surrounding structures is clearly shown. (D) It is essential that the hand is held in full supination when pins are placed in ulna. This illustration represents the view the operator has of the extremity while inserting the pins.

Distal Ulna—Fig. 4

THE ARM is to be placed on an arm board, abducted to a right angle from the body flexing elbow until the forearm is vertical to the floor, with hand in supination.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—A line drawn over the medial aspect of the distal third of the ulna.

PIN INSERTIONS:

Pin No. 1—enters on Line A one fingers breadth proximal to the ulna styloid and is inserted in a lateral proximal direction, passing obliquely across the shaft and protruding one-fourth inch beyond the opposite cortex.

Pin No. 2—enters on Line A three fingers proximal to pin No. 1 and is inserted in a lateral-distal direction, passing obliquely across, protruding one-quarter inch beyond the opposite cortex.

Proximal Radius—Fig. 5

THE ARM to be placed on an arm board about 30° of abduction with the transverse axis of the elbow joint parallel to the floor, with hand in mid-pronation, palm perpendicular to floor with 10° flexion of elbow so you can clarify the cubital crease. Great care must be taken to maintain this position constantly while the proximal radius pins are being inserted.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—A line drawn over the anterior aspect of the radius from the head of the radius distally for about six inches.

Line B—This line parallels Line A one finger's breadth lateral.

PIN INSERTIONS:

Pin No. 1—enters the skin on Line B three fingers distal to cubital crease and is inserted in a posterior-medial distal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Pin No. 2—enters the skin on Line B three fingers distal to pin No. 1 and is inserted in a posterior-medial proximal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Distal Radius—Fig. 6

THE ARM placed on arm board, abducted at right angles and elbow flexed at right angle with transverse axis of elbow verticle to the floor, hand in supination, thumb up.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—is a line six inches in length drawn over the true lateral aspect of the radius over the distal third.

PIN INSERTIONS:

Pin No. 1—Place your index finger in the anatomical snuff box and your third finger on the radius. Pin enters the skin on Line A just proximal to index finger and is inserted in a medial-proximal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Pin No. 2—enters on Line A three fingers proximal to pin No. 1 and is inserted in a medial-distal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Mid-Radius

THE ARM placed on arm board, abducted at right angles and flexed at right angle with transverse axis of elbow verticle to the floor, hand in supination, thumb up.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—A line six inches in length drawn over the true lateral aspect of the radius over the distal third.

PIN INSERTIONS:

Pin No. 1—Place one finger in the anatomical snuff box with two fingers on the radius. Pin enters the skin on Line A just proximal to your fingers and is inserted in a medial-proximal direction, passing obliquely across the shaft protruding approximately one-fourth inch beyond the opposite cortex.

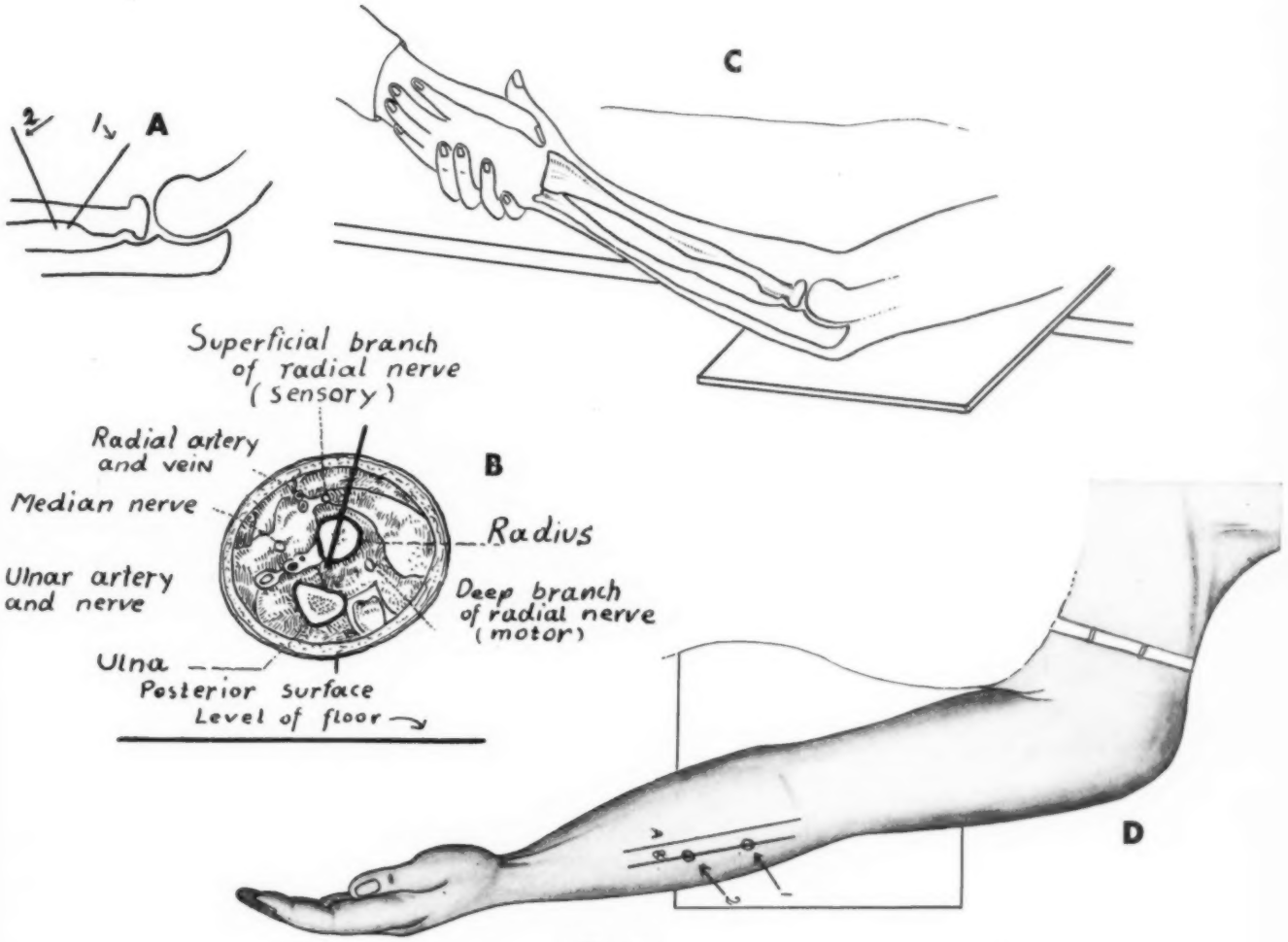


Fig. 5.
Proximal Radius

It is highly important that this position be maintained during placement of pins.
(A) Lateral position showing relative positions of pins.
(B) Cross section through arm at upper radius. Relative positions of pin shown. **(C) Lateral view of position for pin insertion.**
(D) An anterior-posterior view of the topography of the pins for the proximal radius.

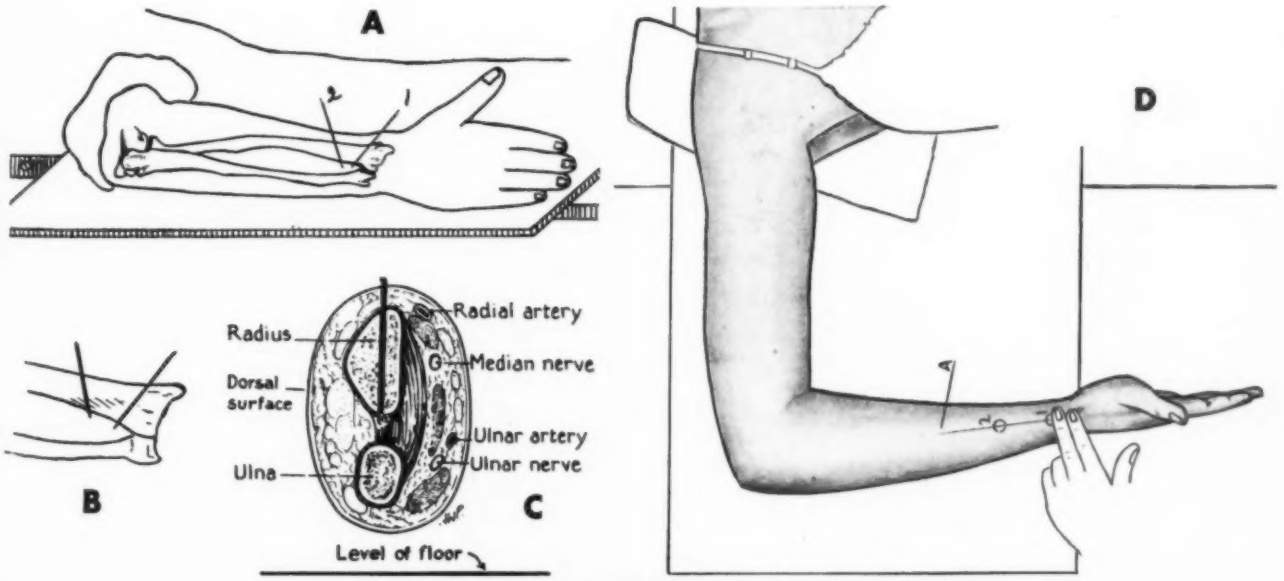


Fig. 6.
Distal Radius

(A) This is a lateral view of the distal radius position with pins in situ. **(B) Anterior-posterior view of pins in situ.**
(C) A cross section through arm above distal radial ulnc joint. This shows relationship of pin to surrounding structures.
(D) Position of pin sites as viewed by operator.

Pin No. 2—enters on Line A three fingers proximal to pin No. 1 and is inserted in a medial-distal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Proximal Femur—Fig. 7

A LUMBAR support is attached to the track of the operating table so that it will support the patient just proximal to the crest of the illium. The buttocks are then brought free of the table while the assistant applies traction with the limb held in adduction with the patella in mid-position.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—A line eight inches in length drawn over the proximal third of the center of the lateral aspect of the femur.

Line B—A line paralleling Line A one inch posterior.

Line C—Bisects Lines A and B at the most proximal prominence of the greater trochanter.

Line D—Bisects Lines A and B at the most distal prominence of the greater trochanter.

Line E—is the line drawn from the anterior-superior iliac spine distally for a distance of approximately 8 inches, directed toward the center of the patella.

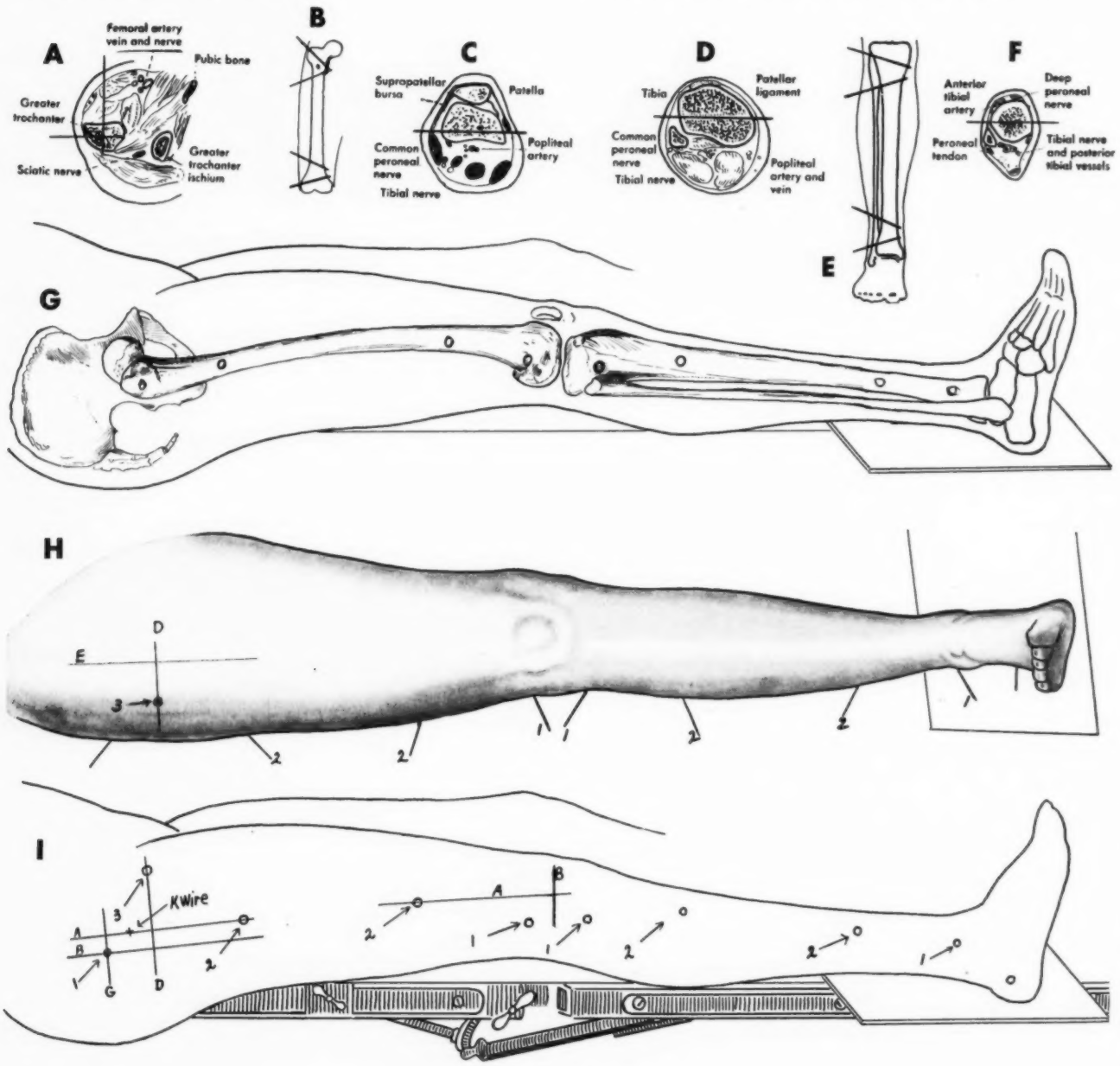


Fig. 7.
Lower Extremities

(A) Cross section through trochanter. The position of pins with relation to surrounding structures is clearly shown.
(B) Location of pins for femoral shaft fractures. The dot between the upper pin assembly locates pin site to be used in sub-trochanteric fractures in place of the lower pin through the shaft.
(C) Cross section through the superior margin of femoral condyles. (D) Cross section through upper leg showing pin site.
(E) Relative position of pins for shaft fractures of the leg seen in the anterior-posterior position.
(F) Cross section through lower leg with pin in situ.
(G) Lateral view of lower extremity with pin sites indicated by small circles.
(H) Anterior-posterior view of lower extremity with various pin sites shown by protruding pins from lateral side of the extremity.
(I) The various pin sites on the skin surface are indicated by the small circles. "B" indicates the location of the knee joint space. Pin No. 3 of the proximal femur is rather difficult to indicate but, with reference to text, the location should be clear.

Kirschner Wire

A MEDIUM Kirschner wire is inserted in Line A midway between Lines C and D at right angles from the patient and parallel to the floor and is probed approximately one-fourth inch into the cancellous bone of the anterior border of the flat surface of the greater trochanter. If this position is correct, this wire will penetrate the bone without the aid of a drill or Steinmann pin handle.

PIN INSERTIONS

Pin No. 1 enters on Line B where it is bisected by Line C and is inserted in a medial-anterior distal direction, passing obliquely across, protruding one-fourth inch beyond the opposite cortex. (NOTE: This pin comes in contact with the Kirschner wire at the bone surface. Then the operator drops the point of the pin three-eighths to one-half inch posterior so that the point enters the center of the flat surface of the greater trochanter and is directed at approximately 22° anterior as it passes obliquely across the shaft at a 45° angle, emerging just anterior to the lesser trochanter.)

Pin No. 2—enters on Line A four fingers distal to the Kirschner wire and is inserted parallel to the floor in a medial-proximal direction, passing obliquely across, protruding one-fourth inch beyond the opposite cortex just anterior to the lesser trochanter.

Pin No. 3—enters on Line D midway between Line E and Line A and is inserted in a posterior-medial direction, passing transversely across the shaft protruding one-fourth inch beyond the opposite cortex.

Distal Femur—Fig. 7

THE PATIENT to be placed on the table with patella in mid-position with toes directed toward the ceiling while the assistant applies traction to the limb.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A—A line eight inches in length drawn over the center of the lateral aspect of the distal third of the femur.

Line B—Bisects Line A at the joint space. Position of this line may be checked for accuracy from the surrounding bony prominences such as the inferior border of the patella, the head of the fibula and the tibial tubercle.

PIN INSERTIONS:

Pin No. 1 enters the skin two fingers proximal to Line B at the posterior border of the shaft and is inserted in a medial-proximal direction, passing obliquely across and protruding one-fourth inch beyond the opposite cortex.

Pin No. 2 is inserted on Line A four fingers proximal to pin No. 1 and is inserted in a medial-distal direction, passing obliquely across the shaft protruding one-fourth inch beyond the opposite cortex, one inch proximal to pin No. 1. (NOTE: If this fragment is displaced posteriorly, the pin must still penetrate the skin and fascia lata at the normal point of entry and then the fragment should be raised anteriorly by flexing the knee so that the pin be inserted into the bone.)

Proximal Tibia—Fig. 7

PATELLA in mid-position, toes directed toward the ceiling.

PIN INSERTIONS:

Pin No. 1 is inserted at a point one-half inch anterior to the head of the fibula in a medial-distal direction, passing obliquely across the shaft and protruding one-fourth inch beyond the opposite cortex.

Pin No. 2 enters three fingers distal and one-half inch anterior to pin No. 1 and is inserted in a medial-proximal direction, passing obliquely across the shaft, protruding one-fourth inch beyond the opposite cortex.

Distal Tibia—Fig. 7

PATELLA in mid-position, toes directed toward the ceiling.

PIN INSERTIONS:

Pin No. 1 enters the skin just anterior to the fibula at a point two fingers proximal to the internal malleolus and is inserted in a medial proximal direction, passing obliquely across the shaft and protruding one-fourth inch beyond the opposite cortex.

Pin No. 2 enters the skin at a point four fingers proximal to pin No. 1 and is inserted in a medial-distal direction, passing obliquely across the shaft and emerging one-fourth inch beyond the opposite cortex.

In placing a Steinmann pin in the os calcis the transfixion of the posterior superior surface of the bone is utilized to counteract the pull of the tendon Achilles.

THE OLECRANON: Insert a Kirschner wire (fine .04, or medium .06) through the fragment of the olecranon with arm in extension.

The distal end of the second metacarpal bone is often utilized for traction by passing a pin through the distal end. A medium size Kirschner wire is used. Arch the hand and push the extensor tendon to side. Enter pin on ulnar side. The fifth metacarpal may also be used in like manner if radical angulation is desired or the second metacarpal not available.

Guide Pin for Smith-Peterson Nail

SKIN LOCATION: *Line A* is drawn over the true lateral aspect of the proximal third of femur.

Line B parallels Line A one inch posterior.

Line C bisects Lines A and B at the most proximal prominence of the greater trochanter.

Line D bisects Line A and B at the distal prominence of the greater trochanter.

INCISION:

An incision should now be made on Line B beginning where Line D bisects Line B and extending distally for a distance of four and one-half inches. The bone should now be exposed, not by going through a great thickness of muscle but by retracting the muscles anteriorly, dividing the muscles posteriorly and exposing the bone by the use of one retractor, retracting anteriorly, and resting the retractor on the anterior surface of the bone. A great deal of difficulty can be encountered if the skin is retracted anteriorly and a true lateral exposure is attempted by going through too great a body of muscle.

GUIDE PIN:

A five-thirty-seconds (5/32) inch hole should be drilled in the lateral cortex starting in the bone at a point two inches distal to the distal prominence of the greater trochanter just posterior to the mid-line of the lateral aspect of the shaft of the femur. A 5/32 x 8-inch Steinmann pin may be used to drill this hole, directing the pin toward the center of the acetabulum as indicated by the skin marker and at a 22° anterior angle. After the lateral cortex has been drilled, a 3/32 x 10-inch Steinmann pin should be inserted through this hole directed toward the skin marker at a 22° anterior angle, as a guide pin. If the operator encounters resistance while inserting this guide pin, he should not attempt to drill it in but check his position as, after this pin has gone through the lateral cortex, it follows across the canal and parallels the medial and inferior border of the neck and should not meet any resistance until it gets in the upper third of the head of the femur. If resistance is encountered, the operator should check the location where he entered the lateral cortex, and the direction of the pin. He should never attempt to drill the guide pin into position. The guide pin should now be checked by x-ray.

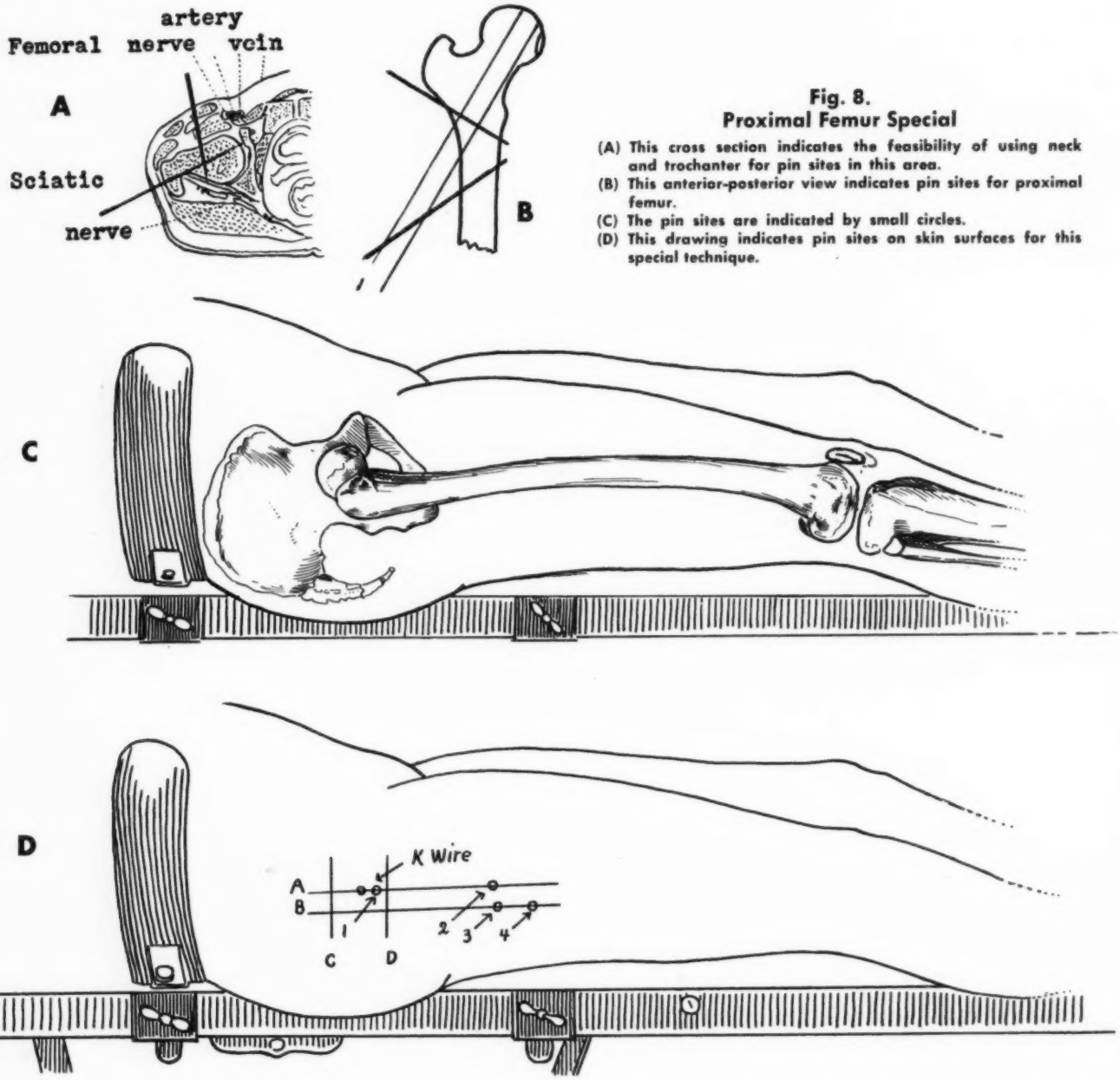


Fig. 8.
Proximal Femur Special

(A) This cross section indicates the feasibility of using neck and trochanter for pin sites in this area.
(B) This anterior-posterior view indicates pin sites for proximal femur.
(C) The pin sites are indicated by small circles.
(D) This drawing indicates pin sites on skin surfaces for this special technique.

Proximal Femur (Special)—Fig. 8

SKIN MARKER: A marker should be placed over the center of the acetabulum to insure accurate placement of the pins. When x-rays are taken of the reduction, they will show if the marker has been placed accurately. Draw a straight line from the anterior superior spine to the center of the pubic spine. Midway between these two bony prominences, where the femoral artery can be palpated, place a skin clip or some type of marker that will attach directly to the skin. Reduction should be checked by A.-P. and lateral x-rays. The surgeon can scrub and the limb should be surgically prepared and draped while the x-rays are being developed.

RADIOGRAPHS:

Anterior-Posterior View: In placing the x-ray tube for anterior-posterior x-ray view, the tube must be centered accurately over the skin marker, because the variation of distance between the skin marker and the bone from the cassette would otherwise distort the true position of the marker.

Lateral View: X-rays are taken without disturbing the patient by increasing the amount of the abduction of the well leg and placing a tube on the medial side of the knee of the well leg. The cassette is then pressed firmly against the body just proximal to the ilium but distal to the ribs at a 60° angle from the body in parallel with the tube. The tube should be centered in direct line with the neck of the femur (thus causing most of the distortion to occur in the shaft) or four inches from the edge of the cassette which is next to the patient's body.

RADIOGRAPHS—READING:

In the anterior-posterior view, it is advisable to immobilize the fracture with a little over-traction to create a coxa-valga angle of the neck. To assure a normal position of the neck, it is advisable to pin the fractures with a coxa-valga position of the neck. As absorption takes place and the fracture impacts itself, and, as the limb becomes subject to weight bearing, approximately one-quarter inch to three-eighths inch shortening usually takes place postoperatively which will result in the restoration of the normal angle of the neck and restore the limb to the normal length.

Fractures that are immobilized under perfect reduction have a tendency to result in one-half inch shortening and a coxa-valga of the neck.

PALPATE BONY LANDMARKS AND DRAW LINES:

Line A is drawn over the true lateral aspect of the proximal third femur.

Line B parallels Line A—one inch posterior.

Line C bisects Line A and B at the most proximal prominence of the greater trochanter.

Line D bisects Line A and B at the distal prominence of the greater trochanter.

INSERTION OF PINS:

Kirschner wire enters the skin on Line A midway between Lines D and C at a 90° angle from the patient and parallel with the floor. If one has the correct location, it will be easy to push the wire into the cancellous bone without the aid of a hand chuck or drill. If not, hard corticle bone has been approached. Check the position of the wire by an x-ray film. The Kirschner wire acts as a guide to mark the center of the greater trochanter in the true lateral aspect of the femur. All pin locations are located from this marker.

Pin No. 4—A 4/32 x 10-inch Steinmann pin with crowe point.

This pin is inserted on Line B or at the posterior border of the shaft of the femur, one hand's breadth distal to the Kirschner wire. This pin is directed at a slight anterior angle toward the center of the acetabulum as shown by the skin marker. When this pin comes in contact with the shaft of the femur (about two inches distal to the distal prominence of the greater trochanter), lower the point entering the dense cortex in the posterior border of the lateral aspect of the shaft. After this pin has passed through the lateral cortex, it should not meet with resistance until it has entered into the head of the femur. If resistance is present before the pin has penetrated far enough to enter the head, check the position of the pin, as you may be trying to force it through the dense cortex of the medial side of the shaft. Once the pin enters the canal and is parallel to the medial or inferior border of the neck, it will obviously stay inside the neck, as it is impossible to drill a surface that is parallel. When this pin is completely inserted, check position with A.-P. and lateral x-rays. While these are being taken and developed, insert the shaft pins.

Pin No. 1—A 4/32 x 7-inch Steinmann pin with crowe point.

Insert a pin parallel with the floor, entering the skin on Line A just distal to the Kirschner wire, in a medial distal direction, entering the bone just distal to the greater trochanter, passing obliquely across the shaft and protruding approximately one-fourth inch beyond the opposite cortex. After crossing the medullary canal and coming in contact with the medial cortex, an Earl safety stop may be attached to the pin at a distance approximately three-eights inch from the skin to prevent over-insertion.

Pin No. 2—A 4/32 x 7-inch Steinmann pin with crowe point.

This pin is inserted on Line A parallel to the floor, four fingers distal to pin No. 1, and is inserted in a medial proximal direction, passing obliquely across the shaft, protruding approximately one-fourth inch beyond the opposite cortex. There should be a distance of approximately one-half inch between the points of pins Nos. 1 and 2 at the medial cortex of the shaft. After crossing the medullary canal and coming in contact with the medial cortex, an Earl safety stop may be attached to the pin at a distance about three-eighths inch from the skin to prevent overinsertion.

Pin No. 3—A 4/32 x 10-inch Steinmann pin with crowe point.

Providing the x-rays of pin No. 4 show correct position in both views, pin No. 3 may now be inserted one-half inch proximal to pin No. 4 and be kept parallel in both planes with pin No. 4 and directed toward the center of the acetabulum as indicated by the skin marker.

Summary

THROUGH-and-through pins may only be used in the distal femur, the lower leg and os calcia and, if a combination of through-and-through and half-pin technique is used, it is suggested that the through-and-through pins be used as the No. 1 pins which are placed closest to the articulating surfaces. We suggest this as they would be considered the weight bearing pins and these pins have the weight distributed over the largest area and at the same time you can have all the advantages of the half-pin unit by making pin No. 2 a half-pin, still being able to maintain the oblique angle that you would not be able to maintain with two through-and-through pins.

It is suggested that in the early experience with pins, lines be actually drawn to guide the operator in locating pin sites. Later, when more familiar with the various pin locations, this may be dispensed with. Also, in pinning very obese patients, proper allowance must be made for the increased soft tissue.

Pin fixation may take the place of open reduction in some cases; however, open reduction and reconstruction surgery has been and will be necessary in certain cases. Pin fixation has proved to be a great contribution to those doing open reduction and reconstruction surgery, as it supplies positive fixation and control of the fragments, allowing early ambulation.

In selecting these pin sites, conditions such as skin abrasions, friction burns or infected areas, should be avoided, and a choice of pin sites selected applicable to the problem in hand.

[IN WRITING this article the work of (1) CODIVILLA, (2) STEINMANN, (3) BOHLER, (4) ANDERSON, (5) C. M. SHAAR and F. P. KREUZ, JR., (6) SPEED and others has been frequently used. The author is directly indebted to DR. H. W. WELLMERLING, of Bloomington, Illinois, for his communication on placement of pins in hip fracture; also, to DR. A. H. DIEHR, of St. Louis, for his original work in pinning the head of the humerus.]

Bibliography

1. CODIVILLA, A.: Means of Lengthening Lower Limbs the Muscles and Tissues Which are Shortened Through Deformity. *Am. J. Orth. Surg.*, 2:353, 1904.

2. STEINMANN, A.: Nail Extension for Fractures. *Zentralbl. f. Chir.*, 34:938, 1907; *Brit. Med. J.*, 2:1534, 1912; *Intern. Clin.*, 4:221, 1926.

3. BOHLER, L.: Apparate zum Einrichten von Knochenbruchen unter Schraubenzug. *Munchen. med. Wchnschr.*, 75:2047, 1928.

3. BOHLER, L.: Die Technic der Knochenbruchdelandlung. *Maudrick Wien.*

4. ANDERSON, R.: Fractures of the Radius and Ulna—A New Anatomical Method of Treatment. *J. Bone & Joint Surg.*, 16:379, 1934.

4. ANDERSON, R.: An Anatomical Method of Treating Fractures of the Tibia and Fibula. *Surg., Gynec. & Obst.*, 58:639, 1934.

4. ANDERSON, R.: An Ambulatory Method of Treating Fractures of the Shaft of Femur. *Surg., Gynec. & Obst.*, 62:865, 1936.

4. ANDERSON, R.: Fractures of the Humerus. *Surg., Gynec. & Obst.*, 64:919, 1937.

5. SHAAR, C. M., and KREUZ, F. P., JR.: Manual of Fractures. Saunders, 1943.

6. SPEED, KELLOGG: Plaster Imbedded Skeletal Traction. *Surg., Gynec. & Obst.*, 51:854, December, 1930.

7. WELLMERLING, HERMAN W.: Fixation of Fractures. *Industrial Medicine*, 13:4, 294-297, April, 1944.

New England Conference

—of Industrial Physicians—

NEW ENGLAND CONFERENCE OF INDUSTRIAL PHYSICIANS met at Boston, February 23, 1944, with the following program:

"An Instructive X-Ray Study of the Shoulder"—DR. C. W. BLACKETT, Boston.

"Correlation of Industrial Hygiene and Industrial Medicine"—DR. IRVING R. TABERSHAW, Boston.

"Observations on Skin Diseases: Industrial and Otherwise"—DR. GEORGE E. MORRIS, Boston.

"Nutrition at the Plant"—FLORENCE G. DORWARD, Springfield, Massachusetts.

"Industrial Rehabilitation of Psychiatric Problems"—DR. SAMUEL TARTAKOFF, Boston.

"Civilian Health in Wartime"—DR. WARREN F. DRAPER, Washington, D. C.

DR. J. NEWTON SHIRLEY, Director of the Conference, opened the program with words of welcome to the assemblage. In his remarks he traced the history of the Conference from its foundation by a small group of Greater Boston physicians engaged in industrial practice, through its affiliation with the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, its appointment as a Component Society of this organization, and its present status.

DR. BLACKETT, in his "Instructive X-Ray Study of the Shoulder," stressed the fact that, for satisfactory x-ray examination of the shoulder joint, exposures in at least four positions should be taken. These he enumerated as follows: (1) the usual antero-posterior view, with the hand in supination; (2) a second antero-posterior view, with the central ray directed at an angle of 23° from the perpendicular, and caudalward; (3) a lateral view—even if the ray must traverse the bisacromial diameter to effect this; and (4) an infero-superior view—with the arm abducted to an angle of 90°, the central ray directed towards the axillary space and the cassette held in place above the shoulder. In referring to this last position he stated that an anterior dislocation of the head of the humerus may be partially reduced and yet give the image of a perfectly good reduction in the usual antero-posterior view. In such a case, the infero-superior exposure will show that the partial reduction really exists.

DR. BLACKETT, re-orientated the group with the structures that make up the shoulder joint. He stressed particularly the functions of the superficial and deep sets of muscles of this region, dwelling at length on their origins and their insertions. He developed the point that, frequently, there is confusion regarding calcifications seen in radiographs of the shoulder joint. These calcifications may be in the bursae or in the articular capsule, or they may be fragments of the humerus itself, torn from the bone by partial or complete rupture of the tendons of insertion of the muscles of the shoulder joint.

DR. TABERSHAW, Surgeon, U.S.P.H.S., and Consultant, Massachusetts Division of Occupational Hygiene, in his timely paper, "Correlation of Industrial Hygiene and Industrial Medicine," admonished the plant physician that his duties required him to be the *public health officer* on the scene in every plant he attends. The full text of this paper begins on page 363.

DR. MORRIS, of the Boston City and Massachusetts Memorial Hospitals, after a resume of some of the commoner industrial dermatoses, considered the synergistic action of combinations of various chemicals which, of themselves, ordinarily do not provoke dermatitis. For the full text of DR. MORRIS' paper see page 365. And MISS DORWARD'S paper on nutrition will be found on page 403.

DR. TARTAKOFF, Chief, Neuropsychiatric Service, Veterans' Administration, Boston, spoke on "Industrial Rehabilitation of Psychiatric Problems." Neuropsychiatric problems can be divided into four groups: (1) the organic with structural lesions; (2) definite insanities; (3) orthoneurosis; and (4) personality problems. Included in the latter are inferior intellectuals, and convulsive types. Some can never adjust themselves to industry. Some can work within the limits of their capacities and can be fitted into selective jobs, such as the paralytics, and the spastic gait and foot-drop cases.

Depressives and paranoids can be kept at some type of occupation. The personality problem cases can be efficient cogs in an industrial machine. The neurotics can do work. They are intellectually O. K. Industry must divorce itself from misconceptions about neurotic-psychotic problems. Neurosis is a form of illness. The variation from the normal in every employee must be recognized. Everybody is subject to the stress of environment—home conditions, housing, food, recreation, etc.

DR. WARREN F. DRAPER discussed "Civilian Health in Wartime." The full text of his presentation begins on this page.

DR. C. D. SELBY, Medical Consultant, General Motors, was the speaker at the evening dinner meeting. His subject was "Industrial Humanics"—the relationship of man to man. He recommended a training program for the rehabilitation of handicapped people and the selective placement of men returned from the war. One placement examination is necessary for the evaluation of handicaps—these may be personality changes or they may be physical defects. He made five different classifications as to the results of pre-placement examinations regarding handicapped workers, beginning with those who had a slight defect and could readily be placed and do most any type of work, and continuing to those who were so bad that they would require additional vocational education and rehabilitation. He stated that the key to the whole situation was definitely in the hands of industry and not in the government. The government can only send the worker to the plant for a job. Industrial medicine's supreme opportunity is now for the rehabilitation and placing of handicapped workers to suit their industries' needs.

Civilian Health in Wartime

WARREN F. DRAPER, M.D.,
Deputy Surgeon General,
U. S. Public Health Service

WE ARE witnessing a nationwide development of interest and activity in health protection for industrial workers. What a heartening contrast this awakened public interest shows by comparison with the industrial hygiene program during the last war. Then there were few full-time industrial physicians, and these courageous souls were treated as step children by their associates in the medical profession. The main function in this earlier period was the emergency treatment of injuries. Legislation requiring the reporting of occupational diseases and payment of compensation had been established in only a few states. Only the largest industries provided for sufficient medical and nursing personnel to carry on pre-employment and regular physical examinations. Governmental services could assist in the solution of industrial hygiene problems in only two states. The Office of Industrial Hygiene and Sanitation, established in the U. S. P.H.S. in 1914, carried on studies of limited number with a small staff.

Now the picture is vastly changed. Where there were only a few hundred industrial physicians in 1917, there are now thousands. The number of industrial nurses has increased from a probable 2000 employed at that time to over 12,000. The largest industries today are employing large corps of physicians, nurses, technicians, and aides to man dispensaries fully equipped to provide complete diagnostic services, emergency treatment for all kinds of injuries and diseases, and to give first aid treatment near the job throughout the plant. Industrial medicine has taken its place in the ranks of respected medical specialties, and young members of the profession are enthusiastically preparing themselves for the great opportunities that lie before them in this field.

An accompanying development has taken place in governmental agencies. The U. S. Public Health Service has expanded its original service to provide a promotional program to aid the states in establishing divisions of industrial hygiene, furnishing technical consultation to these divisions. At the same time research activities have been maintained and enlarged. Promotion of assistance to the states which began in 1937 has resulted in the establishment of divisions of industrial hygiene in 38 states, and an additional 10 local units.

The basis for efficient practice of industrial hygiene has been proved to be well organized teamwork among the members of the professions concerned, namely, the physicians, the engineers, the chemists, and the nurses. State services provide for making complete surveys of industrial hygiene programs on request from industries, utilizing the combined resources of the division's professional personnel. Recommendations are made for correction of hazardous conditions, and suggestions for improvement of the entire health program may be given if desired. Formerly these surveys and other advisory services offered by the states were chiefly concerned with specific hazards known to be endangering the lives of workers. As management has become more enlightened, the emphasis is changing to the preventive aspects of the problem, and to the expansion of industrial hygiene programs to include other adult health services. The industrial hygiene physician in a state or local unit can well promote the services of the state or local health department, such as venereal disease, tuberculosis, nutrition, and health education. In fact, the awakening interest in all these public health services which are now being made available to industry promises to be the beginning of a major attack on adult health problems, long neglected. Industry may well become a focus for intensive development of public health programs, in the same manner that the schools have served as a convenient place to concentrate on child health problems.

A LITTLE more than 25 years ago, in November, 1918, the World War came to an end and we were in the throes of a great influenza epidemic which raged throughout the land. We have recently completed our second year of combat in the present war. No epidemic like the one of 1918 has yet occurred, and we are not too sure of how effectively we could control it if it did. Our concern for civilian health is not to be lessened, because the war has created a train of circumstances that favor an increase in sickness and preventable deaths.

The general death rate in the United States for 1918 was 18.1 per one thousand population; for 1942, it is estimated as 10.4. This is a gratifying reduction, but it has been achieved very slowly. Certain serious threats to the nation's health have been dealt with in a spectacular fashion, and are no longer of great concern. Others have not retreated. And still others have actually increased.

By 1918, we had already made considerable progress in the control of typhoid fever and diphtheria. Even so, the 1918 death rate from typhoid was at least 15 times as high as in 1943; and the diphtheria rate for 1918 was 25 times as high as it is today. In spite of the disruption of civilian life due to the war, typhoid fever and diphtheria have continued to decline since 1941. We know how to prevent these diseases and how to control their spread. And we are preventing them and controlling them at a minimum expense to communities and individual families. State and local health departments maintain close supervision of water, milk, and food supplies, vulnerable groups are vaccinated against typhoid, and a higher proportion of our children and young people have been protected against diphtheria than at any time in the past.

In 1918, tuberculosis was third highest in the causes of death. In 1943, it had dropped to seventh place, claiming about four lives in every 10,000 of our population. Yet, tuberculosis of the lungs still remains the first cause of death among persons from 20 to 45 years of age. These are the young men and women upon whom we rely principally for building our Army and Navy and for producing the weapons of war.

Pneumonia was the second most frequent cause of death in 1918, and this was not altogether due to the influenza epidemic. As a matter of fact, pneumonia continued third among the leading causes of death until 1938, when the benefits of the sulfa drugs began to be felt. Practically all of the life-saving in pneumonia has occurred since 1936. There has been no substantial reduction in the number of *cases* of pneumonia, for we have no preventive for mass application; the sulfa drugs cure but do not prevent.

Although malaria was not listed among the great killers in the United States during the last war, it was among the first 10 causes of death in a number of our Southern states. And it was estimated, at that time, that some 2,000,000 cases occurred each year. No concerted effort was made to eradicate the malaria mosquito in the South until 1935, when Federal funds were allotted for work projects in 17 states for ditching, draining, dusting, and oiling the breeding waters of the *Anopheles quadrimaculatus*, our principal malaria-carrying mosquito. In the last eight years then, we have had a gradually decreasing backlog of malaria infection. This advance has been strengthened by the malaria control work of the Army and the Public Health Service in war areas. A mosquito-free zone is maintained around more than 1,000 military and industrial establishments. The same methods of control would be applied in other areas in the event of an outbreak resulting from the introduction of the infection into a community by returning troops. Thus, on the malaria front, we are more than holding our own as far as this country is concerned, and are slowly but definitely draining the reservoir of human infection which perpetuates the disease.

Medical control of malaria is still far from perfect. Even if we had full supplies of quinine from prewar sources, we still would not have the "perfect drug." Suppressive doses of quinine or atabrine do not *prevent* malaria in the medical sense; they do not prevent the relapses which play an important part in the spread of the disease. Both military and civilian health authorities are sponsoring a coordinated search for that drug—or drugs — which, when found and proved effective, will revolutionize malaria control. As we consider the world prevalence of malaria and its debilitating social and economic influence in vast areas of the globe, the importance of this search for a better weapon is obvious.

IT MIGHT interest you to know the 10 leading causes of death in 1918. They were, in the following order: Heart disease, pneumonia, tuberculosis, kidney disease, cerebral hemorrhage, birth injuries and other diseases associated with early infancy, cancer, accidents, diarrhea, and diabetes.

Diarrhea, principally affecting infants under two years of age, has now dropped out of the picture as a leading cause of death. So have

birth injuries and infant deaths. These conditions have given way and will continue to retreat before the efforts in our health services and hospitals, for better health of mothers and babies. Nineteen forty-three will be the fourteenth consecutive year marking a decline in maternal mortality, a notable advance which has not been checked by the greatly increased wartime birth rate, or by the shortage of civilian physicians, nurses, and hospital beds.

On the other hand, since 1918, diseases associated with old age have increased in importance. Cancer, which was seventh in the 1918 list, is now in second place. The death rate from heart disease, No. 1 in 1918, is still No. 1 in 1943, and has actually increased in that time. Cerebral hemorrhage (which we are more familiar with as "stroke" or apoplexy), kidney disease, and diabetes all have gone up a place or two in the list, and these chronic diseases cause a larger proportion of deaths than heretofore.

The principal reason for this shifting of the causes of death is that, by reducing the deaths from diseases associated with infancy, childhood, and youth, a larger proportion of our population is living to the ages when men and women are vulnerable to cancer, heart disease, and diabetes. Our medical knowledge is not so complete as for the communicable diseases, nor have our methods of prevention and treatment for adult diseases advanced so rapidly. And finally, what little knowledge we have of what to do for the chronic diseases of middle and later life has not been applied on a wide enough scale to alter the death rates from these causes.

MOST of us retain vivid, if diverse, memories of the World War; so it is natural that many are recalling the experiences of 25 years ago and comparing them with current events. Among the most memorable outcomes of World War conscription was the revelation that about one-third of the men drafted for service were rejected as physically unfit for general military duty. And now we are asking, "How does the physical fitness of Selective Service candidates in this war compare with that in 1917?"

That preventable diseases and remediable defects had disqualified such a large proportion of the men drafted for service in 1917 came as a shock not only to the public, but to physicians, research scientists, and public health workers alike. The revealing figures published by the United States Army in 1920 became the spearhead of a fresh attack along the public health front. Moreover, they gave impetus to a new concept which had only just begun to find expression.

Up to the World War, public health and medicine had been more concerned with diseases than with the people who suffered and died of them. The discovery that all the advances in medical knowledge made through many centuries did not suffice adequately to protect our national manpower focused attention on the "host" of the afflicting diseases—on man himself. Hence medicine began to consider the patient as carefully as the cause of his illness; public health began to study groups of people as carefully as the sanitary conditions of their environment.

In the years following the World War, there began an expansion of public health work, the peculiar significance of which has been that we now provide personal services to men, women, and children, as well as laboratory and sanitary services, which although basic in protection of the people are, nevertheless, impersonal. Thus we have pre-natal and post-natal care of the mother and infant; health services for school children; a new approach to the control of tuberculosis through the mass x-ray discovery of infectious cases and treatment of the patients; and a way of stamping out venereal disease by the same approach—discovery and treatment of infected people. In all of these programs, the emphasis is on the health of individuals and families.

The beginnings of this wider front of civilian health were made 20 years ago. Through the years they have grown to a structure of impressive size. And the results have not been inconsiderable. During the past 20 years, the average length of life in the United States has increased from about 55 to 65 years—a gain of 10 years! The average newborn baby in 1943 can expect to live a decade longer than could children born during the World War. This increase in life expectancy is all the more significant when we realize that the gain for the 20 years, 1901 to 1920, was only five years.

Despite these accomplishments, the findings of the Selective Service local boards and military induction centers indicate that we are no better off, in terms of physical defects and disease among the nation's young men, than we were at the time of the last draft. The high rejection rates for physical and mental ailments, however, have not impeded the war effort, nor prevented us from recruiting the finest Army in the world, for the human resources of the United States are as rich as its natural resources. Nevertheless, defective eyes, ears, and teeth continue outstanding causes of rejection, as do also mental and nervous diseases, tuberculosis and other diseases of the lungs, and heart disease.

About 20 years ago, the Public Health Service began a series of studies of illness in a small city—Hagerstown, Maryland—including thorough examinations of school children. Those studies have been continued through the years, so that in 1942 it was possible to compare the childhood records of the young men of Hagerstown with their physical examination for military service. In the majority of cases, the causes of rejection were the same defects or diseases which had been discovered years ago.

Why has there been no improvement in all this time? What can be done about it? Few of us have time to take stock of the vast changes and improvements in medicine and public health during the past 25 years. While science has been making impressive strides, we have not yet realized the full benefits, because we have not put this knowledge to work for the people in proportion to their needs.

Scientific nutrition is a product of the past 25 years. The year that we entered the World War, Joseph Goldberger was proving that pellagra is a dietary deficiency disease. Only a few years before, the word "vitamin" had come into use.

Since then, nutritional science has gone beyond discovering the cause, cure, and prevention of deficiency diseases. We are now thinking in terms of what good nutrition can accomplish in raising resistance to disease, in preventing premature deaths, and in building a healthier, more vigorous people.

In a few short years, since 1936, the sulfonamide drugs have revolutionized the treatment of a long list of infections: blood poisoning, childbed fever, septic sore throat, scarlet fever, pneumonia, and others. The dramatic use of the "sulfas" on the battle front, in public health clinics, and at the bedside of the patient, has become almost as well known to the public as the promise of better nutrition.

Epidemic meningitis can no longer defy the efforts of public health and medicine. Sulfa drugs, in the great majority of cases, now prevent the once probable death.

Before the World War, our knowledge of mental illness was extremely limited. Our institutions for mental patients were little more than their names suggested—asylums, where the mentally ill could be kept apart from the community, but where comparatively little could be done to restore the mental health. Modern psychiatry is playing an increasingly important part in the present war, and will continue to extend its preventive and curative benefits among larger groups of the population after the war.

Our national effort to wipe out syphilis has been strengthened by new methods of treatment which greatly shorten the traditional methods. All but the most stubborn cases of gonorrhea now respond to the sulfa drugs in a week's time, and penicillin is used successfully with resistant cases as well as with the average case.

The future triumphs of chemotherapy cannot be predicted. The discovery and use of penicillin have opened a new field of research and accomplishment in the life-saving sciences.

With these and many other advances in public health and medicine, with a good structure of public health services which has withstood the strains of war, the civilian health front in the United States remains strong. Once the energies and resources, which now must be applied to the medical and health needs of our armed forces, are released for the needs of the entire population in the postwar years, we can look forward to a new era in public health.

The venereal diseases can be wiped out within a few years' time. By means of mass chest x-ray examinations and prompt treatment of active cases, tuberculosis can be reduced to a minimum. Much can be accomplished in restoring to health persons afflicted with chronic diseases and other disabling ailments which cannot be prevented.

The medical and dental professions and the public health authorities, working together, can bring these things to pass. There is every reason to hope that the work that has been done to maintain military and civilian health in wartime will not lose momentum, but will be the starting point for much greater accomplishment in the years ahead.

Healthy Morale is the Heart of Industry

J. H. HESS, M.D.,
Medical Director, Jack & Heintz, Inc.,
Cleveland, Ohio

INDUSTRY'S greatest problems for the duration of the war will continue to be (1) shortage of manpower, and (2) loss of man-hours due to absenteeism. As the demands for military and naval needs continue, the drain on manpower is expected to be more and more acute.

At the establishment of Jack & Heintz, Inc., this problem found its answer in the far-sighted labor management policy inaugurated at the beginning of operations by our President, WM. S. JACK.

For the benefit of those who have not heard of our company, we would like to mention briefly that Jack & Heintz operate six factories in the greater Cleveland area.

The company first began operations in February, 1940, at Palo Alto, California. In November of the same year, it moved to a little plant in Bedford, about 15 miles south of Cleveland, and, with a personnel of 36 associates, began the manufacture of an improved airplane engine starter.

From then on, events developed rapidly. Greater and more pressing became the demands of the navy and army air forces, to meet the exacting requirements of a rapidly expanding air program.

The urgency of these requirements demanded production schedules which under the circumstances seemed humanly impossible. Men worked from 12 to 18 hours a day; some literally "lived" in the plant, but the schedules were met and the reputation of the company grew.

Soon followed government demands for even greater effort in the mass production of automatic flight instruments, directional gyros, gyro horizon indicators, servo units and energizers, which were followed with generators and then with landing gear retractor motors. In addition to engineering and mechanical problems, the company faced the pressing problem of expanding its personnel in a dwindling labor market.

The JAHCO policy had been set up to meet just such a problem. This policy can be classed into three general sections—good wages, good treatment, and good health. All three are vital and are concurrently operative.

It is to the health program that we give special consideration, for it holds a definite solution to the personnel problems prevalent today.

Long Hours, No Hardship

AT PRESENT we employ about 7600 associates whose work schedule calls for two shifts on a 24-hour operating basis, seven days a week.

Hours worked per week average from 77 to 84 hours for associates in the shop, while those of some executives average from 98 to 112 hours weekly.

Dispensary in one of the plants, where registered nurses administer first aid. Associates are urged to care for all injuries immediately, no matter how trifling they may be

Some people not familiar with our program contend that these long hours undermine health and reduce efficiency, and that three shifts, instead of two, would work to better advantage. However, to do this would require another 2400 skilled and semi-skilled people as well as the supervisory and executive force necessary to staff another shift, all in the face of dwindling manpower in an area already facing an acute manpower shortage.

Our health program makes it possible to maintain these longer working hours without ill effects. Records show that associates gain in weight and enjoy at least normal health and in most cases better health than previously, although some have been working on this schedule for more than three years.

Medical Center—Examinations

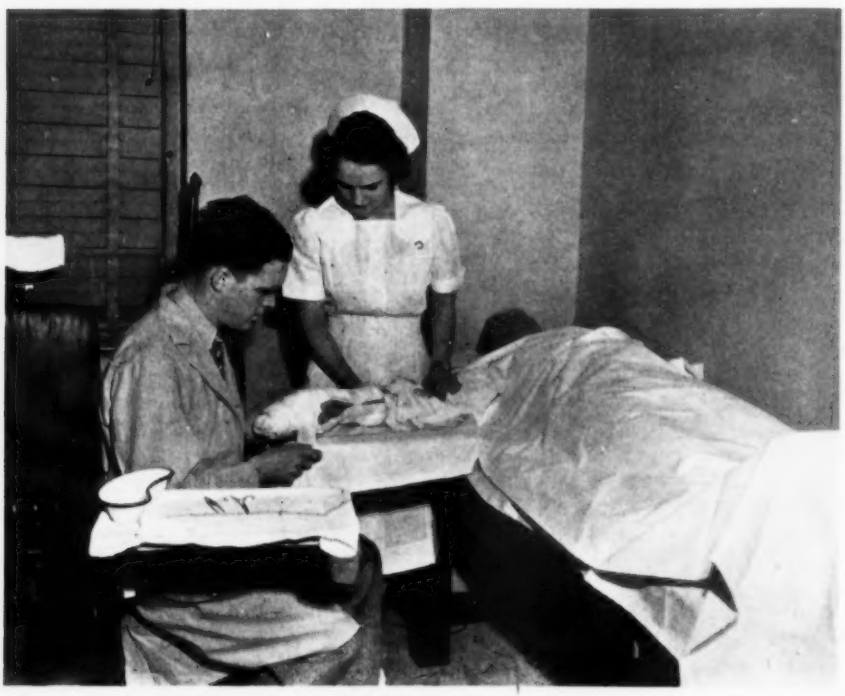
WE MAINTAIN a medical center which carries out a physical examination program for all associates. New associates are given a pre-employment physical examination, which includes a history of past employment, and past illnesses and accidents, covering also any experience in the armed forces. It includes the usual procedures and many special features, such as an x-ray of the lungs on everyone and other x-ray examinations where there has been previous trouble or injury.

It also includes, in some cases, complete blood work, electrocardiograms for heart function, special visual tests, particularly for color blindness, and general tests of muscular coordination and of muscular development.

We have established a program and are carrying out a schedule at the present time which will complete a re-examination of all associates yearly. We call this a periodic re-examination.

This re-examination is somewhat more searching, more thorough and complete than the pre-employment physical examination in so far as complete blood counts are done on all female associates. Electrocardiograms are done, wherever indications warrant and on all who are over a certain age.

A serological test is done on all the re-examinations, and an increasing number of blood-typings is being carried out. The periodic examinations of associates who have definite deviations from normal are carried out at more frequent intervals than once a year; some cases involve only re-x-ray of the chest, while others involve a complete urinalysis or blood pressure check, or weight check.



After prompt first aid by registered nurse at plant dispensary, injured hand is given prompt attention by physician at Jahco Medical Center

Prevention Emphasized

WE TRY to find conditions of early disease and then repeatedly check on these conditions to see if the treatment instituted is improving the condition or eliminating it.

Our medical center is maintained largely on a diagnostic and advisory basis. Such treatments as are rendered are emergency and simple remedies for immediate relief.

Diseased conditions which require longer treatment, observation or surgery are referred to the private or family doctor at once. If conditions are diagnosed as requiring the attention of a specialist, such consultation is urged or advised.

A very complete and comprehensive physical examination is done on all executives and key personnel at regular intervals. This involves not only a physical examination but

also complete blood studies, x-ray of the chest, and of the sinuses and any part of the body where symptoms point out trouble. Electrocardiograms are taken routinely. It also includes blood typing and evaluation of the effect of stress and strain on the person, as a whole, particularly on his or her nervous reaction. Where signs of pressure and fatigue are noted, appropriate measures are taken to relieve them or perhaps increase this person's ability to carry on by the use of recreational vacations.

Upon re-examination of associates, blood tests are made and there are a certain number who voluntarily agree to act as donors in certain emergencies that may arise among fellow associates. These are catalogued as to blood type, and a record is kept in a special file showing where such associates can be reached day or night in case of emergencies.

We are able to concentrate into a little more than one hour a very complete, thorough, and searching physical examination. This would ordinarily consume about two days in the average hospital. This is accomplished by a smooth coordination of effort by doctors, nurses, laboratory technician, x-ray technician, and secretarial personnel.

Frequent Plant Inspections

REGULAR inspection of working conditions is carried out with the cooperation of the plant protection, fire control and safety departments. This includes inspection of working conditions in relation to heat, light, and ventilation, and the equalization of temperatures in certain plants.

We try to give attention to sanitary conditions in general and cleanliness of the plant equipment and personnel in particular.

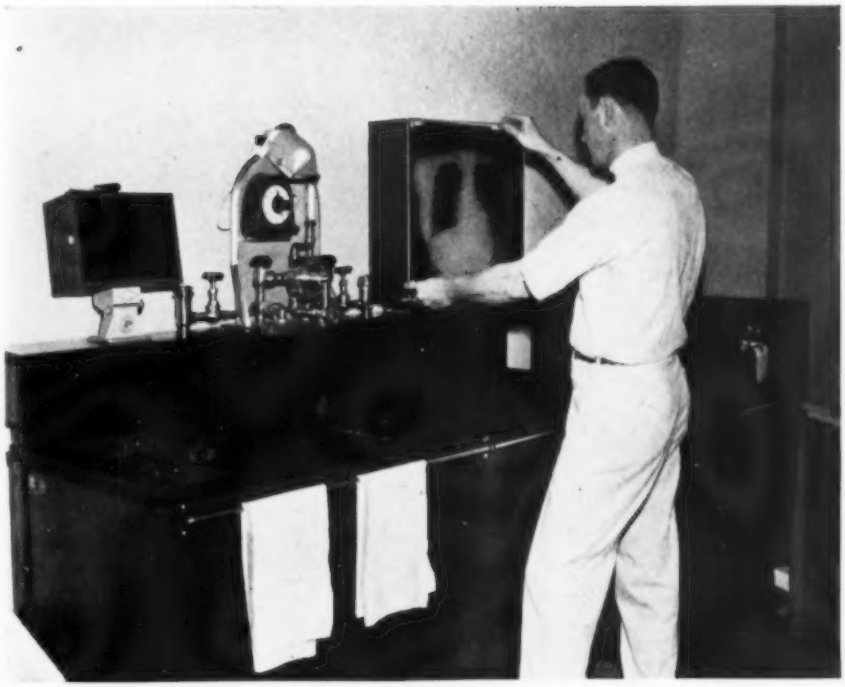
Possible toxic hazards which may involve gases, odors, glaring lights, the threat of foreign bodies flying into the eyes, and the effect of excessive noise and such conditions are given special attention.

There is a perpetual campaign waged to educate our associates that the slogan "Accidents do not happen—they are caused" is entirely true.

By removing the cause, we avoid the accident.

Personal Problems

MANY of our associates have questions and problems in regard to themselves, and there are also some that involve the health of some member of the family, and what is best to do about it.



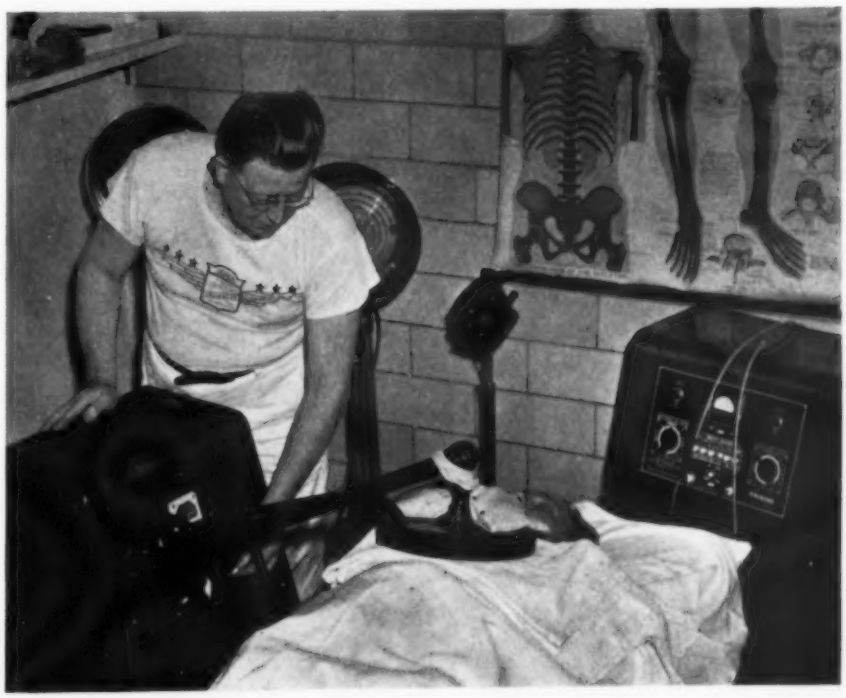
X-ray technician, Bob Kleypas, develops a film in the dark room

Sometimes they involve the question of whether a surgical operation should be performed, or the problem may be that of a child not doing well in school.

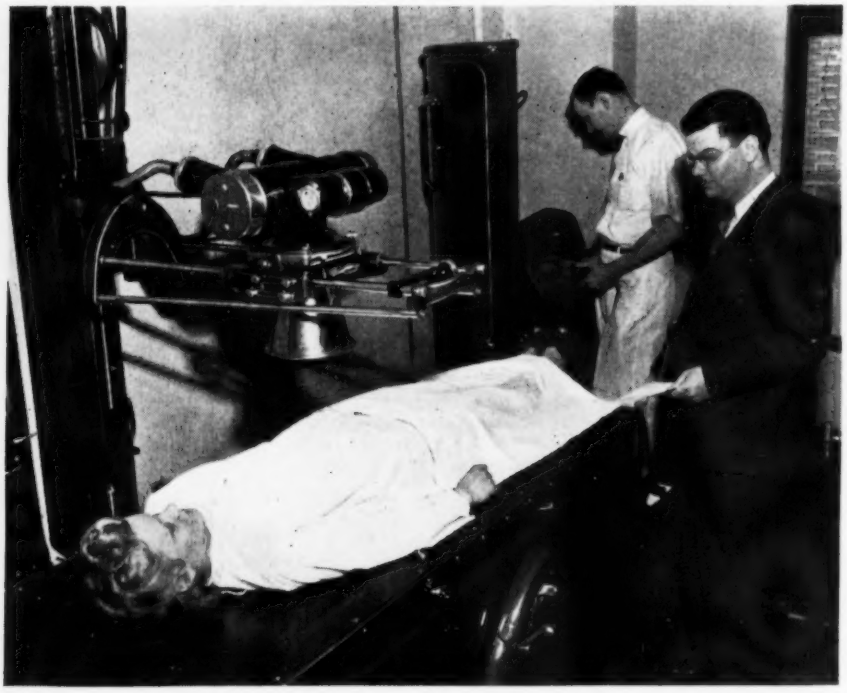
Some associates desire information as to what may help them better their work. These personal problems are discussed every day with our associates, their wives and their foremen, and these discussions have helped us untangle knotty problems which in many instances were causing undue worry and fear.

Physiotherapy Departments

WE MAINTAIN separate physiotherapy departments for men and women in all plants. These departments are staffed by licensed masseurs and masseuses. We believe these contribute much toward relieving fatigue, nervousness and high-strung conditions. The proper uses of heat, massage, sun-lamp, and steam rooms provide some of the best tonics to a person who is tired, who may be having some aching in the muscles from either over-use or localized colds, or who



Short-wave diathermy being administered to an Associate supervised by the licensed attendant in charge



Dr. Hess supervises an x-ray of the spine, with the assistance of the x-ray technician

feels that he is depressed and must take time off to recuperate.

Hours spent in such therapy save many hours which may be lost if these things are not taken care of immediately. All our associates are united in their declaration that one must experience for himself the relaxation produced by these treatments to appreciate their benefits.

Shoes and Foot Comfort

NO TRUER words have ever been spoken than these: "When my feet hurt, I feel sick all over." We have proved that good foot care is very excellent health insurance.

Lifeless legs, backache, pain on the soles of the feet, muscle cramps, bunions and corns are all the result of wearing poorly fitted shoes for long periods of time. Such conditions are corrected by properly fitted, scientifically built shoes, which the company furnishes to associates. Records compiled from a foot survey determine how often and who should have replacements.

Freedom from Fear and Worry

FREEDOM from fear and worry will produce a state of mind which is bound to result in better production and health. The medical center is continuously giving professional advice to alleviate unwarranted fears about things that may never happen, by relieving worries about various supposed physical conditions which cause anxiety in associates' minds.

To relieve worry over these conditions is a very important part of our job. Most worries and fears that beset human beings are magnified out of all proportion to the real, fundamental trouble present, and that is especially true when it occurs in ourselves, because we are too close to it to evaluate its degree or severity.

When we free the associate's thought of a fear of blindness, or the fear of cancer or some other disease, we have lifted an untold weight from his mind, which, having been freed, can better concentrate on problems vital to production.

Our medical center cooperates in important community health activities, including participation in the programs aimed at the eradication of tuberculosis in our associates as well as in our community.

The same applies to the educational campaign about cancer, its early diagnosis and cure. We are cooperating 100% in the prevention and the treatment of infantile paralysis as it may occur.

In regard to contagious diseases, our policy is to work very closely with the health departments of the various cities and villages in this section.

Prevention of disease by proper vaccination and inoculation is another important feature, as is advice on the control, avoidance, or proper treatment of venereal diseases.

Dr. Dale Needham, Director of Dentistry, doing prophylactic work in the dental unit

Dental Department

OUR MEDICAL program also aims to improve health by the improvement of the dental condition present. A dental department is located in each of our three plant groups, where associates are given complete dental x-rays and diagnostic services.

Prophylaxis, extractions, and emergency treatments are made available to associates. Permanent fillings and major dental work are referred to the associate's regular dentist. The importance of good, regular dental care cannot be overemphasized.

Dispensaries and Nursing Service

DISPENSARIES are maintained in each plant group where regis-

tered nurses with special training are on duty 24 hours a day, to administer to the needs of associates in cases of accidents, emergency, or treatment for minor illness. Company ambulances are available in case of accidents in the shop or on the road, and several visiting nurses are employed to maintain contact with associates who are sick, to make sure they receive proper medical attention.

It has been a source of great comfort and satisfaction and has been life-saving to be able to provide special nurses on unusually severe cases of illness among the associates. These cases are of the catastrophic variety — emergency surgery, pneumonia, infections, and accidents. There is such an acute shortage of special duty nurses that we felt we must help in this regard. In so doing, we have had the supreme gratitude of many of our associates who otherwise probably could not have survived their severest test and gotten well.

Food and Vitamins

THE medical center is the clearing house on the question of foods and diet and what they do for the human body. The radio, magazines, and many so-called health institutes all have their own ideas about diet. Some are good and some are not. We have tried to establish safe, sane and simple rules about foods and what they do for a person's nutrition without being too profound or dogmatic.

Modern sanitary cafeterias are maintained where a hot, well-balanced meal is served to each shift daily. In this regard the use of vitamins is a close relative to food and we, therefore, supply vitamins as a food supplement.

In some people, foods are not absorbed and utilized as in others and, therefore, everyone needs to have certain minimum requirements daily of the known vitamins.

Health, Happiness and Good Work

WE BELIEVE that a healthy associate is a happy associate, and a happy associate is the heart of JAHCO.

We believe our associates' health is their most valuable asset. Its upkeep is very little if not neglected, but once health is lost, the element of cost looms larger and larger and in some cases no amount of money in the world can buy it back.

We have proved to our entire satisfaction that the money spent on our health program is a good investment, and pays dividends over and over again in better workmanship, better products, and increased production.

A toothache that can be avoided, a lame back relieved, a foot trouble corrected, a cold warded off, keeps the associate on the job and his productive capacity up to par while he is there.

We believe that industries which have not tried a comprehensive health program will find the inauguration of one profitable, not only in the saving of lost man hours, but also in solving many of the production problems for which the human factor is responsible.

Laboratory work is included in examination given to applicants for jobs, and to all Jack & Heintz Associates annually. Blood count and blood typing being done here

Nutrition in Industry

FLORENCE G. DORWARD,
Director, Nutrition Service Bureau,
Springfield, Massachusetts

THE value of proper nutrition has been established. The question now is how to assist employers and industrial physicians in the application of the principles of nutrition so as to maintain full vigor and efficiency.

Management is still anxious to keep up production. There is a real interest in the numbers of hours lost, days missed from work, the maintenance of efficiency throughout the entire working period. Efficiency will play a real part in postwar industry. Quickness of perception, quickness of response, rate of fatigue will have more and more significance to the man who is doing the hiring. One working man with these qualifications can be worth more to a concern than 20 who have poor health. Dr. Victor Heiser, in his article in the current number of *Survey*, says, "Fatigue point can be raised by eliminating physical defects, worry, bad posture and malnutrition. Speed in the factory depends on the diet of the man on the assembly line. He must be taught to get the vitamins and minerals he needs in his daily diet."

There are two main ways that we might promote better health through nutrition in our industries. First, by a good, well-run cafeteria service, and, second, by a sound educational program. Let us first consider the cafeteria service. Too often industry dismisses its obligation by just having a cafeteria or food service canteen. There is much more to it than just that. The food produced and served must still have some nutritive value left in it. Then too, if we are to encourage good eating habits, food must be appealing in appearance and, above all, taste well.

I am convinced that the American taste for food is not too fussy, for much of the food that is offered to the public doesn't deserve the name of quality at all. Many res-

Presented at NEW ENGLAND CONFERENCE OF INDUSTRIAL PHYSICIANS, Boston, Massachusetts, February 23, 1944.

taurants and bake shops have used the term "home-made," but certainly, if it is true, it is no credit to the American homemaker. I am astonished over and over again at what some people call good food.

A worker entered a cafeteria and went through the line but found nothing that appealed to his taste or sight. He chose to go without lunch entirely rather than select from the food displayed. After that he brought his lunch, which was most inadequate, for his wife was the type who wouldn't bother to put up an interesting lunch.

I think the physician should take an interest and lend his influence to see that a qualified, well-trained person is selected as director of the cafeteria or food service. It will cost money, but if a firm is to attempt to influence the health of the worker by providing food service which will be, at least, one-third of his day's food intake, then it is vital that it be set up and operated efficiently and well. All workers need food that still has nutritive value. Another suggestion for the promotion of good food is that a "Victory Menu" which contains a well-balanced meal of essential foods be provided. Workers may be enticed to take this if the price is made popular. There is a fear on the part of some that we will be in a position of forcing workers to eat certain foods. A common saying often quoted to me by management is, "We give the worker what he wants." This usually means meat, potato, pie and coffee, and this can be no credit to management, nor the cafeteria director. The greatest need is to promote health, to stimulate greater knowledge in order that the worker will want what he should have.

The physician could be of help also by suggesting to executives that surveys or evaluation studies be done from time to time on the effective use of available equipment, improvement on menus, and service of food. This kind of service is being made available by the subcommittee on nutrition of the Massachusetts Committee on public safety. Mrs. Quindara Dodge, who is chairman of this sub-committee, and director of the Vocational Training Department of the Women's Educational and Industrial Union, will be very happy to receive, and help with, such requests. She may be reached at 264 Boylston Street, Boston, or at Simmons College, where she heads the Institutional Management Division of the School of Home Economics.

There is need for a much closer relationship between cafeteria service, plant management and health services. Could not such a relationship be brought about by a joint committee? Such a committee should very definitely include a representative of labor.

The second big way to promote health is through a well-grounded and sound educational program.

I have the probably erroneous opinion that doctors are more interested in disease than health; that nutrition is all very well to them when applied to some specific deficiency, but not of much interest when thought of in terms of a seemingly healthy individual. It is, of course, interesting that the nature of some industrial work requires sodium chloride, and that it is thought that a high ascorbic acid intake is called for when working with certain high explosive material. It has even been considered beneficial to a depressed mental state to step up the in-take of vitamins. I think, however, that the full value of nutrition is when it comes before any deficiency is noted.

Education, of course, is a long, slow and unsatisfactory process. Writing a menu certainly is not as satisfying as writing a prescription. I feel there is a real weakness in writing a prescription with no educational advice to go with it. Thiamin deficiency can be rectified by the in-take of the drug, but there is sure to be a recurrence unless the deficient diet is corrected and food habits are changed.

WHAT educational programs can be encouraged in the plants? Good movies are available. Neighborhood or plant meetings could be held in which profitable discussion could be had on "good suggestions for lunch box menus"—"what goes into a good paper-bag lunch"—"how important is a good breakfast." Exhibits can be had, as well as poster displays for bulletin boards, at pay windows or time clock, or in the health unit. Pamphlets and fliers which can be taken home can be made available at some central place or tucked into the pay envelope. The physician could well add some questions on nutrition when giving physical examinations. Such questions as, Do you drink milk? If so, how much? Do you use whole grain bread? How often do you eat some raw vegetable? Of what does your breakfast consist? Another device in the educational scheme is a pair of scales, strategically placed. This, with a telling poster nearby, can get a good many lessons across. I have seen and heard the results of such a venture in a large cafeteria. It is quite satisfactory.

The success of a nutrition program, whether in the cafeteria or educational work, depends, first, on your enthusiasm and cooperation, and, second, on a person, or preferably a committee, taking the responsibility for the program. It must be well thought out. It is a question involving many problems, such as racial diets, poorly established food habits, already existent poor management in the cafeteria, time allowed for lunch, the odd hours of work. It seems to me that no one person can solve all these problems, but with a committee composed of the industrial physician and nurse, the safety or health representative, the personnel department and labor, some plan might evolve that would definitely contribute to the health of all in the plant. Some one person may be delegated the responsibility to carry out such a plan, for each of the above named may be too busy to do it.

It might be helpful to know what resources we have here in Massachusetts that could be helpful in such a project. Let me again mention Mrs. Dodge, of Simmons College, together with the State Health Department, and the Civilian defense program which is run in cooperation with the State Health Department. In each district of this state, and I am sure it is true in our other New England states, there is an extension service available. And, of course, our Federal government always stands ready to help. There may also be a private service, such as the one in Springfield which I direct. The Nutrition Service Bureau is a private agency supported by Community Chest funds. We are just beginning an industrial program and so far are providing consultation service, and poster and other educational material to six of the industries.

Production means high stamina and efficiency of work. Let us each shoulder some responsibility and take an interest in seeing that some educational work is done in the plants. Health involves many things, but nutrition is one of the main pillars. As Harriet Elliot said, "We have a job to do. Let us make every American strong, stronger than ever before, sturdier in body, steadier in nerves, surer in living."

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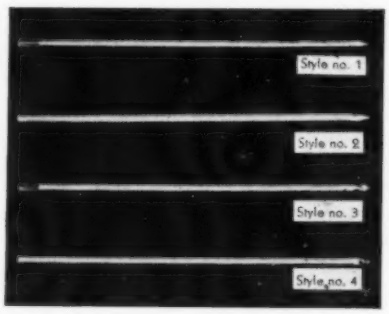

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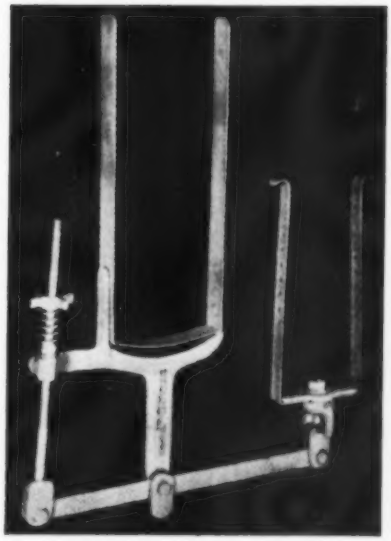

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Lay Politics in a Medical Field

NOT ENOUGH people are familiar with H.R. 4371, introduced in the House of Representatives in March of this year. This is a bill that ought to have a lot of publicity, principally because its progress and that of H.R. 2800 which it supersedes, have been directed so secretly, and so suddenly. These bills express the Perkins-inspired effort to have the Department of Labor take over the industrial hygiene activities of the various states. Hearings on the original bill were held on five days in June, 1943, and no one connected with the U.S. Public Health Service or any state department of health knew about these hearings until after they had been concluded. H.R. 4371, now pending, aims to provide for the Labor Department to cooperate with "state agencies administering labor laws in establishing and maintaining safe and proper working conditions in industry *and in the preparation, promulgation, and enforcement of regulations to control industrial health hazards.*" It would authorize $5,000,000 a year to be allotted, by the Secretary of Labor, "for use by cooperating state agencies administering labor laws on the basis of (1) the population; (2) the number of wage earners; (3) the special safety and health problems in industry; (4) the number of workers afforded protection by the state laws and the cost of proper and efficient administration of such laws; and (5) the financial needs of the respective states." The money so allotted to any state "shall be expended solely in carrying out the purposes specified. . . . and in accordance with rules and regulations prescribed by the Secretary and the plans jointly developed by the agency administering the labor laws of such state and the Division of Labor Standards and approved by the Secretary of Labor. *In the operation of such plans the available services and facilities of public health authorities in the field of industrial hygiene shall be utilized.*" The Secretary is to have a "Safety Advisory Commission . . . hereby authorized and directed to recommend . . . reasonable standards, methods, and procedures for establishing safe working conditions in industry with a view to encouraging more effective control of hazardous conditions by the several states." There will be the usual "such employees," appointed by the Secretary, and the usual fixing of their compensation. An additional quarter-million per year for "all necessary expenses" in administration is to be provided. The italicized lines indicate the important additions to H.R. 2800 which appear in H.R. 4371. The latter bill was referred to the Committee on Labor, whence it emerged with majority approval; but a minority report by Rep. A. L. Miller (Nebraska) caused it to be sent to the Committee on Rules where it is at this writing. The unctuous rhetoric that oiled the arguments of the Labor Department for this bill revolved around the lost time and cost of industrial accidents and the need for accident control. The accident situation was likewise the burden of the other testimony heard by the Committee.

When it became noised abroad that the almost ex-parte hearings on the first bill had been held, a salvo of cogent arguments against it was prepared for the information of the Congressmen. These arguments are implicit in the circumstances:

1. Industrial hygiene is a health matter, not a labor matter.

2. Industrial hygiene activities are now being handled, *and excellently handled,* by the Federal and state public health officers, through their Divisions of Industrial Hygiene, and their sanitary, engineering, laboratory, nutrition and other public health facilities.

3. The present effort to extend the scope of the Labor Department's authority to the control of industrial health hazards and to "special safety and health problems in industry," in so far as health and health hazards are concerned, disregards the obvious fact that such extension would duplicate existing facilities. This duplication is completely unnecessary—so patently unnecessary as to label the efforts to bring it about bureaucratic and political in the worst sense in which these terms are critically employed, to say nothing of the fact that the proposal involves a wholly needless expenditure of taxpayers' money.

4. Health departments have the ability to carry on health and hygiene services *impartially.* This is inherent in their professional status for this status not only demands the ability but also imposes the duty to be impartial. No physician, no engineer, will risk his reputation by being anything but impartial. This, however, cannot be said of those whose tenure of position depends on the good will of pressure groups; the official careers of such are mosaics of carefully-graded preferences and partialities.

These arguments, and others that suggest themselves, are more cogent than ever in view of the inclusion in H.R. 4371 of the provision that "the available services and facilities of public health authorities in the field of industrial hygiene shall be utilized." Are these "weasel words?" Does the "shall be" mean that the "available services" are to be asked, or to be ordered? Or will the next step be to insure the desired

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state cooperation by holding out the bait of larger allocations from the five million to those states which will transfer their industrial hygiene activities from the state health to the state labor departments. In some such way the "available services and facilities" could be got around and wouldn't be needed. No one familiar in any respect with current bureaucratic interpretations of Acts of Congress, nor past bureaucratic pressures on state governments through allocations of Congressionally-appropriated funds, can fail to foresee the conflicts of authority, the confusions and duplications, and the insidious pressures that are inevitable here. But here the possibilities are more or less evident. What else lurks in the disguised intentions of the smooth way in which the *"enforcement of regulations to control industrial health hazards"* is woven into the text of the bill? Or in the powers delegated to the "Safety Advisory Commission," which would authorize it to confuse and interfere with health regulations and procedures already put into satisfactory effect by the public health authorities? And the carefully detailed basis of the allotments by the Secretary, to the "cooperating state agencies administering *labor* laws?" Why not the "cooperating state agencies administering *health* laws?" But that, of course, is a foolish question!

From the standpoint of all persons interested in health, and this includes everyone—physicians, hygienists, employers, and employees whether they belong to a union or not—this bill should be defeated. This for the reasons above mentioned and the further reason that it is not honest. If it were honest, its avowed purpose would be to improve *health*, and the five million would go to the state and Federal health agencies instead of only to "cooperating state agencies administering labor laws." The existing health agencies could use more money. Their combined budgets for the best year they ever had weren't half of five million. They know how to spend money wisely and effectively for health purposes, and they have done and are doing a fine job. They are experts, qualified by profession and by experience, and they do not need non-medical competition. Instead, they need help. They could use more appropriations and more personnel. A little of both distributed among them would enable them to *add* more to what they are now doing for *health* than many times as much would enable the Department of Labor to do *in toto* in 10 times the same period.

We have no idea regarding what the Department of Labor might accomplish in safety, if it confined its over-reaching to that alone. But we do have a good picture of what it *can not* accomplish in industrial health and hygiene. That picture includes everything except more offices, more power, more pressure on the states to "cooperate," and more confusion. Meanwhile, how is anybody's health going to be improved? Health cannot be legislated into a plant, any more than disease can be "collectively bargained" out of it. If the Secretary of Labor and her advisory group are sincerely interested in safety, the Secretary should use the efforts of the Department of Labor to decrease the accidents which the representatives of the Department, in the statements that appeared in their printed arguments for the bill, said were increasing, and should omit all references to health and health hazards in H.R. 4371. If accidents are increasing and funds are needed to decrease them, that is another story. But it isn't any part of that story to attempt to fool Congress by crying "wolf" (i.e., that accidents are increasing), and in the resulting excitement subtly try to take over the public health field that is so quietly doing a magnificent job in industrial hygiene in preventing industrial health hazards and aiding in innumerable unheralded ways in keeping up war production.

Education plays an important role in accident control, and if the Secretary of Labor and her advisers were as primarily interested in safety as they would have us assume, the facilities of her department would be forcibly brought to bear on the one safety measure that will really reduce accidents: "safety education." Industrial physicians and safety directors know too well the tragic number of accidents that could have been averted had effective educational safety measures been instituted. But education in health is needed, too, as well as education in safety. Health education, however, should be undertaken by those who are qualifield to do it. A good many are puttering around in it now who are qualified by nothing more than their offices and titles. Of course, all efforts in this direction have some value, but no effort is permanently effective unless properly and understandingly made. In order that health education in general may be most effective, it should be closely coordinated with the health and hygiene activities that are now professionally directed. It might be a good idea, therefore, to put the state health departments in full charge of the promulgation and enforcement of *all* health and hygiene matters—even in those states in which this is now directed by the labor departments. Why not, since the health authorities are doing all the other work anyway?

It could be added that this education might well begin in Washington. The Congressmen at the hearings last June undoubtedly had no knowledge as to what the Federal and state health departments and officers are doing. They should be told of it. But the Department of Labor *did* know what the Federal and state health departments and officers are doing. The Congressmen should be told of that, too.

"If You Can Keep Your Head . . ."

LAST month we called attention to the need for current definitions of public health, on account of the conflicting philosophies of the various agencies which are rivaling each other in this domain. Because many of them are attempting to invade or influence the sphere of industrial medicine, we pointed out that we can no longer remain oblivious to their concepts or their intents.

In the space of an editorial it is impossible to enumerate the agencies which are churning the field of industrial health and to describe, let alone evaluate, their activities. It must suffice to generalize by stating that older agencies have increased their pre-existing activities, new agencies are attempting to invade an area they previously ignored, and hitherto unheard of subdivisions are appearing overnight with brand new programs. Funds supporting these activities are greater than usual, owing to the extravagance of wartime expenditures; and, because of the "War Activity" label, paid personnel is available in large numbers, and volunteers find an outlet for their emotional upheavals.

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DIVISION of TUBERCULOSIS CONTROL
PROVINCE of BRITISH COLUMBIA
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• 3700 of these are between the ages of 15 and
• 700 are under the age of 15.
• Tuberculosis slows down war production.
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The Mobile X-Ray Unit examines workers on the spot. Whole populations can be reached quickly, efficiently.
TUBERCULOSIS IS PREVENTABLE

In this folder the citizens of British Columbia are told about the mobile chest x-ray survey unit bought with the money which they themselves contributed through the purchase of Christmas Seals.

The steadily increasing number of these G-E equipped travelling x-ray laboratories, operating in all sections of the continent, is the best evidence of acceptance of this method, and the demonstrated efficiency and practicability of this G-E development.

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As might be expected in such circumstances the activities vary from the sound and practical to the incongruous and untimely.

The sum total of these conditions is to subject industrial medicine to a veritable onslaught of proposals which, from a pharmacological angle, might be called "Compound Tincture of Pollyanna." Were the situation normal in the ranks of industrial physicians, we believe the dose would not overtax their digestions and that some therapeutic benefits might be derived. But the situation is not normal, and, like the medical profession at large, the ranks of industrial physicians have been fairly well depleted of their regular complement of young, aggressive and active members. Add to this the inadequate number of replacements, themselves handicapped in many instances by age or otherwise, and the established industrial medical programs are too often struggling against curtailment instead of being able to contemplate expansion.

The same conditions which handicap the medical profession are also operating to lessen the facilities for medical care in the community, and these presently exaggerated difficulties constitute the text for those who take advantage of abnormal war conditions to advocate long-term changes in our present structure.

We do not view the status in medical economics which existed before the war as perfect. Neither do we expect the cessation of hostilities to result in any immediate and spectacular institution of Utopia. We believe that there are many problems which must be thoughtfully and objectively met, and that, in meeting them, medicine as it has been practiced must undergo some changes. It is unfortunate that emotionalism during wartime plays such a prominent part in the discussion of such changes. Those who are taking advantage of the war to advocate a medical revolution distort the picture in their urge toward haste in the adoption of their ideas. Those who feel that their citadel is being attacked unfairly in the absence of so many of their brethren in the armed forces probably over-compensate by adopting a reactionary defense. We cannot feel that any legislative change which basically alters the practice of medicine in any of its branches, passed now can possibly prove to be predicated on sound thought or foresight. Any such legislation will affect industrial physicians as well as the profession at large. To be satisfactory in results it must have at least the acceptance, if not the active support, of the profession. This cannot be obtained today because—on account of the absence of so many doctors and the abnormal demands on the time of those remaining—the medical profession is suffering from the lack of a quorum.

In the meantime, we can only exhort those who are carrying on in industrial medicine to continue to render the best service possible under the existing conditions. This will call for concentration on those services which have proved necessary, useful and practical, and for cooperation with the community and governmental agencies which, by past performance, have demonstrated their ability to offer constructive assistance. In evaluating the offerings of these agencies, the physician must be able to discriminate as to programs that are sound rather than noisy, practical rather than plausible, evolutionary rather than revolutionary, and that offer opportunity rather than opportunism.

DR. PILGRIM

READING maketh a full man," says the philosopher, "and conference a ready one." Wherefore, because of many books and more meetings, it were appropriate that I now be both, but instead I do seem not either, being thoughtful of impressions the which are confusing in form and bewildering in substance. . . . THUS of the observations: (1) by CAPTAIN MANN (page 373) on "the rationale of the six-hour work day," and (2) on the "long hours, no hardship" by DR. HESS (page 399) with questions in between: How much is fatigue a mental attitude?—How much of interest springs from education?—How to educate? Whereof MR. BLOOMFIELD'S statement (page 418) that "with adults in all walks of life, education must be made a part of living" could have emphasis on the "*must*." Must, indeed! The man who turned a compressed air hose at the buttocks of a fellow-worker as he was bending over and released a blast of air, causing a perforation of the rectosigmoid and immediate operation! The two witnesses in the manslaughter trial of a worker who, giving a "hotfoot" to another whose clothes were soaked with a cleaning compound burned him to death, testifying that this prank was commonly played in the war plant where they were employed! Whereof it would seem that the three "R's" should have a fourth, to be taught from childhood up, this being the "R" that stands for the Relation between cause and effect, the which should be at least as well known throughout the land as the daily baseball scores. A forthright man on being asked "What is a fishwife?" answered: "The wife of a fish." In equally simple obviousness, a "reactionary" is one who understands and has respect for the reaction that follows upon action. With more of such understanding and respect there would be more of the commonsense that weighs the act to be done in terms of what *it* will do. . . . AND THUS of the new discoveries currently in the news: As that by New York's "Little Flower" of the insurance principle for a health plan, this one to cost but 4% of pay. And that by the Treasury Department, broadcast of late with lavish use of print, that clothes can be made with paper patterns (as to which same see Butterick, 1879). And that by the people of the country generally of things regarding the state of the Union the which are disconcerting in the extreme. And that by so many more each day, that war means small white crosses planted row on row. . . . THE WHICH do crowd one's mind, a horde of confusions, inviting to laughter and tears together, and needing a prayer for orderly calm within, and ultimate peace without. . . . FROM which it was heartening to hear Ohio's Governor Bricker at the Executives Club, on a safe and sane America, void of schisms and free of social phantasy and economic fumbling. And calming to participate in a concert, playing Beethoven's 8th, a sprightly but dignified ensemble; and Tschaikowsky's "Romeo and Juliet," combining the agonies of poison with the sweet lyricism of love; and Liszt's "Preludes," a pot-pourri of emotional expression reaching the heights of technique with nuances most pleasing. FROM which to lectures: in a university post-graduate course anent the medicolegal problems, waxing in complexity; to physicians in a southern county, where was much stimulus regarding the important role of the general practitioner in industrial medicine; to a foremen's group in Michigan, on fatigue and non-occupational conditions and diversions as a cause thereof; and to a lay-medical assembly on health education, where was much of interest and intelligent questioning. And likewise to hearings on claims, as to which there were weird measures invoked to connect the progresses of maladies to the processes of manufacture, with no relation between them. And also to an industrial hygiene meeting, where DART, ROOK, STREB and GREGG described the great medical and hygiene services of a huge war-engine plant. And then to hearing of the new science, which SELBY calls "Humanics," of which the whole significance will be man-to-man. . . .

AN EFFECTIVE BARRIER AGAINST MANY *Offending Substances*

In their early stages, skin reactions to industrial irritants follow a fairly well-defined pattern. According to Macleod, "the first objective evidence of irritation to the skin is dilatation of the blood-vessels of the papillary and sub-papillary layers, with slowing of the blood-current and exudation of the leukocytes and plasma." This initial phase apparently is uniform, regardless of the causative factor; differentiation occurs later.

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Workers' Participation

—In a Health-Safety Program—

J. J. BLOOMFIELD,
Senior Sanitary Engineer,
Industrial Hygiene Division, Bureau of State Services,
U. S. Public Health Service

THE MOST challenging opportunity ever offered American labor to advance the well-being of working men and women is now in the hands of the workers. There are many reasons for this, but the most important is the vital role of labor in winning the war. The colossal task of war production falls ultimately upon the skill and staying-power of the workers. American labor has carried that burden to ever-mounting production peaks. Recent reports show that we have made progress on the production line as significant as our victories in Africa and in the Pacific. No small part of that victory is due to the increasing interest of labor and management in the worker's health and safety.

I have been on this job of industrial health since the last war, and I want to tell you that the situation today in THIS field is just about as different as the production of Model T Fords was different from turning out the airplanes, tanks, and other armament you are now making. In the first place, no union in the last war would have invited a group of medical and engineering personnel to advise it on health and safety, as you of the UAW have invited your Medical Advisory Council. Then, too, not more than a handful of industries were interested in the broad problem of industrial health. Not many more had tackled that of accident prevention.

Today, the interest in health services and safety for industrial workers is wide-spread; it is mounting; it is vocal; it is specific. Management is extremely active in the interest of safety and health. Labor—either through union activities or through joint labor-management committees in the war industries—is calling for advice and action. The unions are recognizing more and more that their contributions to the well-being of the individual worker must parallel their activities for economic betterment and conditions of employment.

The United States Public Health Service, and particularly its Industrial Hygiene Division, welcomes the new interest of the unions in health and safety. We know that progress in any phase of national health cannot be achieved without the understanding and support of the people directly concerned, and, in industrial hygiene, that means largely the workers themselves.

Now, as I understand it, the techniques of public health are not the same as the techniques of organized labor. But with the same ultimate goal—that of better health and greater safety for the workers—these two forces have much in common. If I tried to tell you how to apply labor union techniques to the health and safety program, I would be about as effective as a radio commentator telling the President and Mr. Churchill how to run the war. What I can do, and what I want to do, is to tell you some of the public health techniques that have worked pretty well for the last 40 or 50 years. These methods, or modifications of them, can be applied to industrial health and safety, and in my opinion are useful guides for workers' participation in the program.

Any public health program that will pay dividends must have permanency and continuity. By and large,

Presented before the First Health Conference of the Medical Research Institute, UAW-CIO, August 27-28, 1943, Detroit, Michigan.

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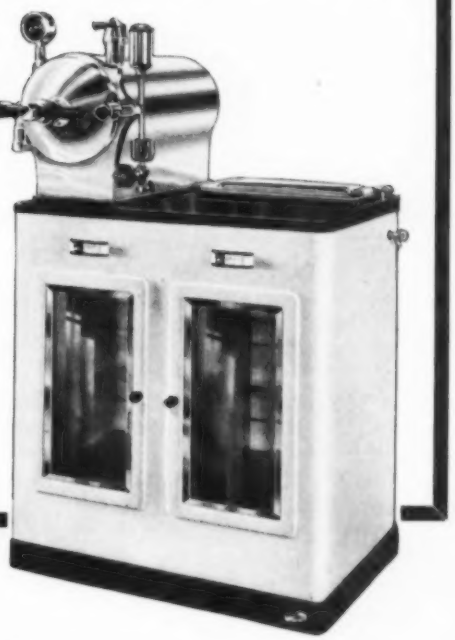

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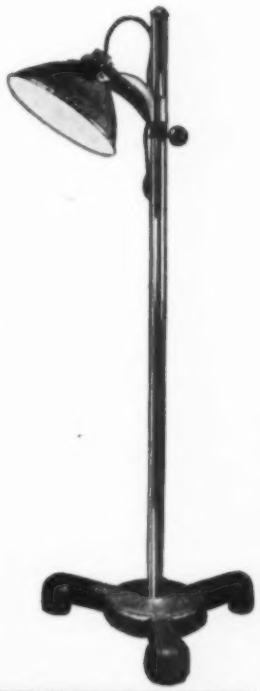

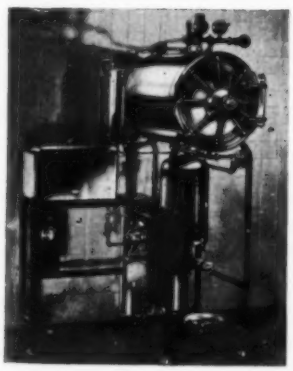

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the programs that are planned for permanent, long-term results are supported and continued. Permanency depends very largely on three factors: practicality; willingness to cooperate; and use of all available resources.

First, PRACTICALITY. Can this thing be done? Is the goal actually attainable? You will be interested to know that this was the first consideration of the recent United Nations Food and Agriculture Conference, to which the Surgeon General of the U. S. Public Health Service was a delegate. All the experts from 44 nations pooled their knowledge and came to the conclusion that freedom from hunger throughout the world is a realizable goal. If your goal is health and safety for your members, you will need to pool a great deal of knowledge in many fields in order to build a practical program.

Second, WILLINGNESS TO COOPERATE with many individuals and groups with whom you may or may not have a working agreement. I am cognizant of the fact that this may be contrary to the philosophy of many labor unions. I know, from my public health experience, that it is the hardest assignment. But I know that it works. How do you think we have controlled formerly high accident rates and occupational diseases? Some of the richest stories of the Division of Industrial Hygiene are around the conquest of silicosis and lead poisoning through cooperation with rugged individualists and powerful interests, who were at first sceptical of our program. The job was tedious, annoying, and often disheartening—but the results were permanent.

Third, USE OF ALL AVAILABLE RESOURCES. It's just plain commonsense that no one organization is ever going to attain health and safety single-handed. The complexity of services, equipment, facilities, and personnel needed to translate a blueprint into healthier men and women proves the point. In wartime, the use of existing resources is imperative in the health and medical services because of the serious shortage of doctors, dentists, engineers, nurses, and other professional personnel, and because of the curtailment of civilian supplies. The use of available resources ties in closely with cooperation. I should say that cooperation must be a two-way street. If, for example, a union is willing to work with management in developing a practical medical care program, then management, the medical profession, and the local hospitals, should give full cooperation. The same should be true if management and the professions wish to work with labor.

In order that you and I will be discussing the same things, I would like to review quickly what we believe are the essential elements in an industrial health and safety program. You will find the items I mention discussed in greater detail in the Outline of An Industrial Hygiene Program which the U. S. Public Health Service published about a year ago.

Broadly, the program aims to achieve and maintain three goals: (1) A safe and healthy working environment; (2) a healthy community environment; and (3) healthy, well-adjusted men and women engaged in industrial production.

To accomplish these purposes, each plant needs a medical service, plant hygiene and safety services, and certain welfare services.

The medical service, with the appropriate staff of medical, nursing and other personnel is responsible for emergency care of injuries and sickness acquired on the job, but of more importance for the practice of preventive medicine among the workers. The latter service also has as its aim the reduction of non-industrial sickness through PREVENTIVE measures.

The responsibility of the plant hygiene and safety services, working closely with the medical department, is to create and maintain a healthy working environment. This means that every job in the plant is made as safe as scientific knowledge, modern equipment and eternal vigilance can make it.

Among the welfare problems directly and indirectly related to health are medical care for workers and their families, the proper placement of workers in jobs suited to their health status, as well as to their skill; personal financial and emotional problems; recreation; and health and safety education. To solve these problems and to secure a healthy community, the plant should seek the cooperation of Federal, state and local health authorities. Problems of housing, sanitation, control of communicable disease, maternal and child health, and nutrition affect directly the health of workers and their families. The services of local health departments should be utilized to the full in solving these problems.

If you will think over the various elements of the program I have outlined, I am sure that you will agree with me that the workers' participation is needed at every stage. At the present time I believe you will agree with me, too, that the program should be organized as a joint endeavor of labor and management. The majority of the services must, of necessity, be located in the plant if the workers are to be reached. The problems of transportation, long hours of work, and shortage of medical and technical personnel make the provision even of the preventive services in the field of general health outside the plant both impractical and undesirable during the war emergency. The workers are spending three-fourths of their waking hours at work, getting to work, and getting home. With very few exceptions, the activities of the health and safety program, therefore, should be carried on in the plant.

Since management is required by law under the workmen's compensation acts, to provide some of the services I have mentioned, most plants have the nucleus of a medical service. I would like to see labor get in on the ground floor with management to expand these skeleton services into a well-rounded health and safety program, including all the elements I have outlined.

The War Production Drive Committees representing labor and management in some 4,000 plants have shown the way to effective teamwork in solving some of the toughest war production problems. I believe this method can be applied to the health and safety programs. In fact, many of these committees have interested themselves in health; some have appointed health subcommittees. More local unions are appointing health committees to consider and deal with the problems of their members. More plants are establishing medical services. But working apart from each other, neither the union committee nor the plant medical service constitutes a real health and safety program. The value of joint action in this field is best illustrated to my mind by the experience we had a few years ago in the State of Utah.

For years the workers in the metal mines and smelters of Utah tried to obtain through the Legislature the passage of an occupational disease law. Management regularly fought the passage of such a law on the strength that there were insufficient facts concerning the prevalence of occupational diseases in Utah industries on which to base a constructive law. This went on for some 10 years until, through the intercession of the State Industrial Commission, the U. S. Public Health Service was invited to conduct an

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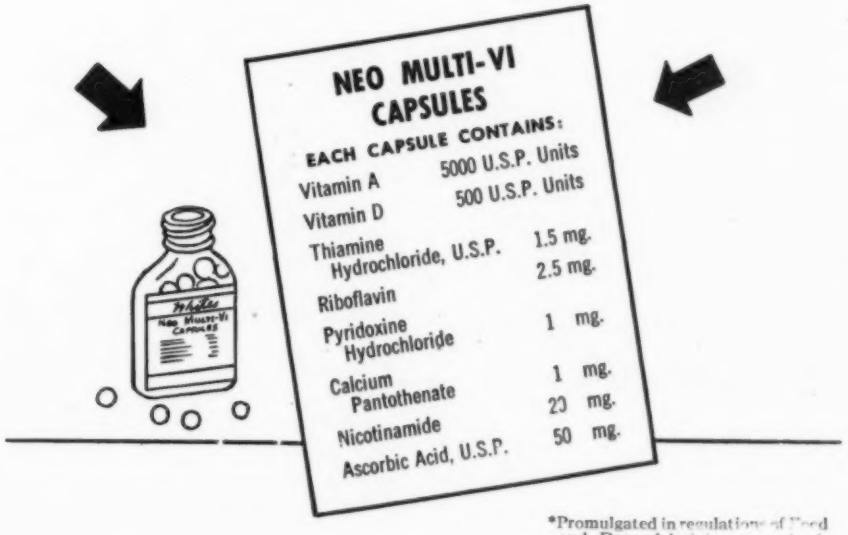

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impartial and fact-finding survey of the occupational disease problem in the state. This job was delegated to our Division.

The Public Health Service accepted the undertaking, provided, first, that both labor and management would agree to cooperate with the Public Health Service, and second, the Legislature would appropriate a token of money, not for the purpose of defraying any expenses of the survey, but primarily to allow the State Health Department to participate in the study, and at the same time lay the foundation for a permanent preventive service. This was done, and on the basis of our findings an occupational disease law was drawn up for legislative consideration. Here, too, the law was prepared through the joint efforts of labor and management, since the committee preparing the law consisted of representatives of management, the two unions in the state, and representatives from the medical profession and the public. In other words, labor and management together wrote the Utah law, which gives adequate coverage for those occupational diseases indigenous to the state.

One of the first problems with which labor should concern itself is the expansion of medical services in the war plants. The larger establishments, of course, have broadened their programs to include preventive services, but a great majority still operate on a minimal basis, providing what amounts to no more than first aid for compensable injuries. It is unlikely that these plants will expand the services unless there is a demand for a good health and safety program. It is here that the workers themselves can most directly participate through their representatives. A study of sickness-absenteeism in the plant could be initiated by the labor-management health committee. Through this same machinery, plans could be developed for a well-rounded medical program, linked closely with other elements, such as the maintenance of healthful working conditions and safety.

A further development might evolve from such an arrangement, namely, the provision of general medical services for the workers and their families. At the present time there is a shortage of civilian medical services in many communities. War plants constructed in isolated areas often have the only available medical personnel and facilities. In the emergency, medical services for general illness and for workers' families are also essential to the war production drive. Through joint participation in the health program, the workers and their employers should accept the responsibility for working out a concrete plan for obtaining such services, utilizing, of course, every available source of medical and nursing personnel, hospital facilities, etc.

Again, labor and management together should seek the goal of the healthful working environment. The problem of exposures to occupational disease hazards, insanitary work places, poor lighting, ventilation, and inefficient maintenance are creating a veritable epidemic of headaches to both labor and management at this time. You would be surprised to know that, in the past several months, the Public Health Service has dealt with a score of threatened strikes in various parts of the country, all due to health problems. We have also dealt with numerous requests from management. And our work is a small part of the total done by the 47 state and local industrial hygiene services which are our field army. In every one of these instances, the trouble could have been averted if management and labor had learned the ABC's of teamwork in the health and safety field: A—have a responsible committee representing both the union and man-

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agement devoting its energies to the solution of health problems; B—prompt reporting of suspected or obvious hazards or bad conditions *to the committee;* C—calling promptly upon a neutral, expert third party to investigate the problems and recommend solution.

I want to tell you of an instance in which I could see the urgent need for this kind of teamwork. Last April, when I was on the West Coast, the Health Commissioner of the State of Washington asked me to assist in a serious health situation which then prevailed. The Health Commissioner, the Director of the Division of Industrial Hygiene, and I went out to a shipyard employing some 8,000 workers. There had been an outbreak of dysentery, affecting about 750 persons. The workers were on the point of walking out unless something was done. The source of trouble was very easily found. The old septic tank, designed to serve about 500 people, had overflowed and was discharging the sewage from 8,000 into the lake on the shores of which the yard was situated. Then, through some mishap, probably a cross connection, the polluted lake water was siphoning back into the shipyard drinking water. Result—750 sick workers, some of them in the hospital. Now the point I want to make is that the union had not worked out any technique but the walkout threat for dealing with an obviously dangerous situation. Management, too, hard pressed to turn out ships, had taken but little action to improve the situation. But with the State Health Department, the third party, threatening to take drastic action, things began to move. And that point brings me to the third activity in which labor and management can make a powerful contribution to the workers' health.

We are all of us taxpayers today, and we are entitled to certain government services, not the least of which is the public health department. I have outlined the responsibilities of these agencies. I now urge you, through your labor-management committees, to work with your local health officers, your state industrial hygiene services, and your Federal Public Health Service—work toward better health services in your communities and toward a fuller use of those in existence. In the instance I mentioned before, an active labor-management health committee could have put pressure on the proper authorities months before the epidemic, to provide adequate sewage disposal facilities. It is through your industrial hygiene units, too, that you can bring to your members in the plant the most up-to-date methods for the control of tuberculosis and venereal diseases among your members. Remember that the amount and quality of the health services your community gives you depend very largely upon the size of your health department's share in the tax dollar. Labor and management *together* represent the most powerful influence in a community and should see to it that the right kind of services are provided.

There is one phase of the health and safety program which I believe should be of, by, and for the workers; namely, the educational program. We all agree that organized labor and individual members of the unions are young in this broad field of health promotion. No other group of adults in this country offers a greater opportunity, a greater promise of fruitful results in health education, than union members. The development of a good health and safety program actually depends upon the growth in health knowledge and health skills by the workers themselves. Only thus can future advances be planned and put into action.

With adults in all walks of life, education must be made a part of living. Hence, the close relationship of the worker to his union and its activities makes it essential that the union bring him accurate, interesting information on a subject so vital to him as his personal health, and the well-being of his family. Practically, it is also easy to incorporate health education activities into the labor education program of the union. We know that in past years unions have devoted their attention chiefly to the education in the philosophy and functions of unionism and to cultural subjects. More recently, attention has been directed to social and economic problems of national scope and to the patriotic purposes of winning the war. I strongly urge unions to accept health as a social and a personal problem of first importance to the worker, and to include a well-planned program of health and safety education in the activities of the Medical Research Institute and in the local unions. Federal agencies, including the Public Health Service, and state health departments, as well as numerous voluntary health associations, could give much help to the unions in the organization and operation of these programs. As an example of the immediate value of such a program, I would point out that union health committees such as are now being organized would be in a much better position to carry out the functions planned for them if they had access to the methods and materials of a health education program.

As we think back over the years in which public health and organized labor have emerged from their first pioneering eras, we can see the peaks and valleys of accomplishment and defeat. Yet, in both movements, the word has been onward. As a result, there have been important shifts in emphasis which have brought the two movements closer in aim and in partnership. The early accomplishments of public health have been principally evidenced in the saving of lives among infants and children; hence, more people are living to become productive workers and on into old age. Public health emphasis, therefore, is shifting more and more to the conservation of adult health—without, of course, losing one inch of ground gained in the protection of the young. Emphasis in organized labor is shifting more and more to social and political gains for its membership.

The logical and constructive outcome of this common aim is a closer, more active cooperation between the workers and the health services at every level. The United Automobile Workers are establishing a program which I believe should and will provide the leadership among our local unions necessary to implement that cooperation. Both now in the war emergency and in the postwar world of tomorrow, teamwork will be the first requirement if the goal of better health which we envision is to be attained.

[NOTE: The "Highlights in State Health Department Activities," beginning on page 420, are powerful evidence (1) that the state health departments are doing a good job; (2) that they possess the "know how" to do a better one if properly supported; (3) that they need more money and more personnel; and (4) that any new governmental appropriations or allotments should go to them rather than toward setting up competing agencies which, necessarily, will be long in starting and, when they do get going, will be duplicating a lot of the work already done, instead of advancing the whole front of industrial health. These "highlights" should be read (1) in connection with the editorial on page 406, and (2) with the thought in mind that they do not include the tremendous and excellent work of the Division of Industrial Hygiene, National Health Institute, U.S. Public Health Service. The record of that work is even more eloquent of the need for *more of it as it is being done,* rather than any development of additional agencies to start doing it again, and, of necessity, doing it not nearly so well.—ED.]

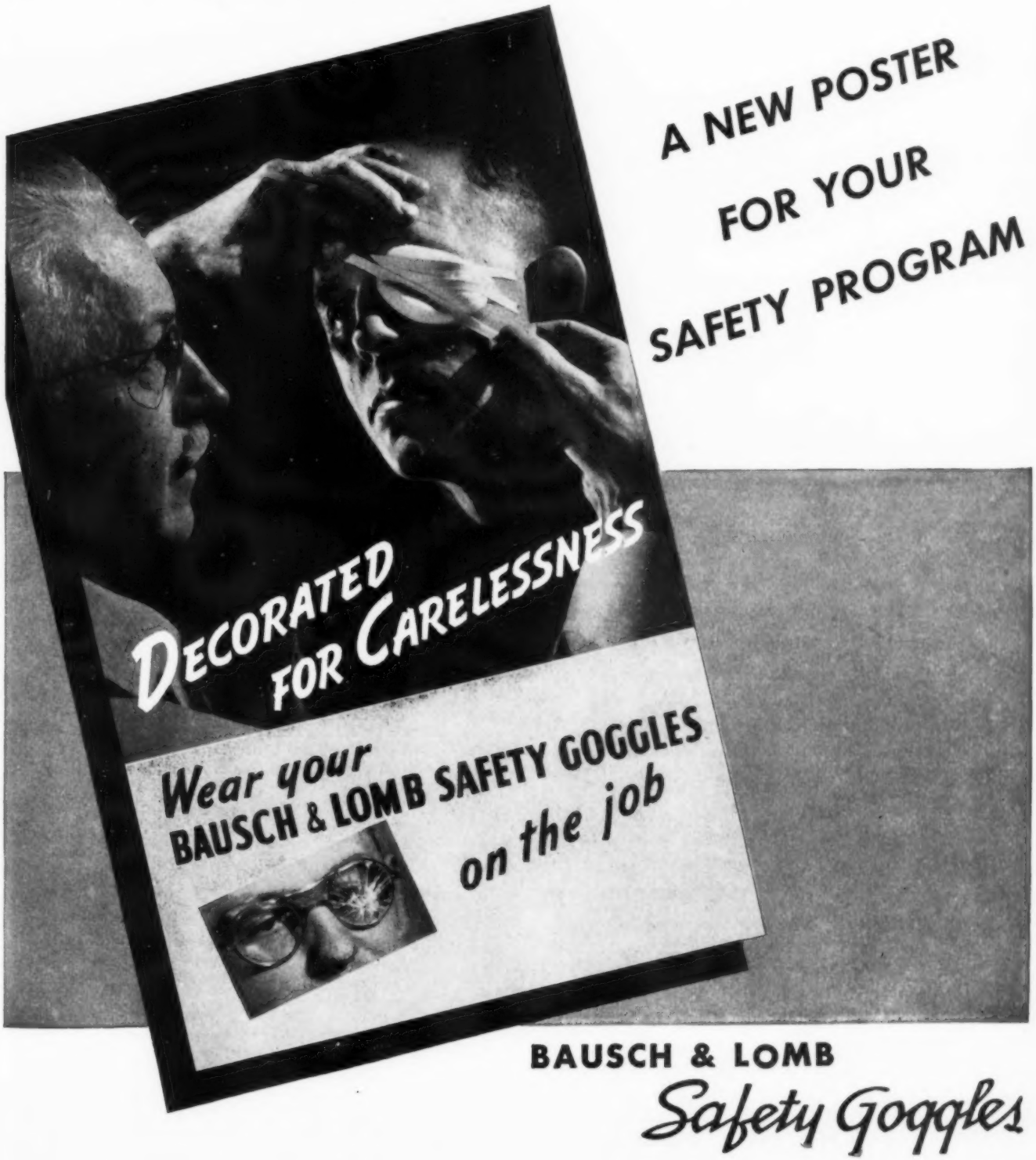
How to get Workers to Wear Safety Goggles

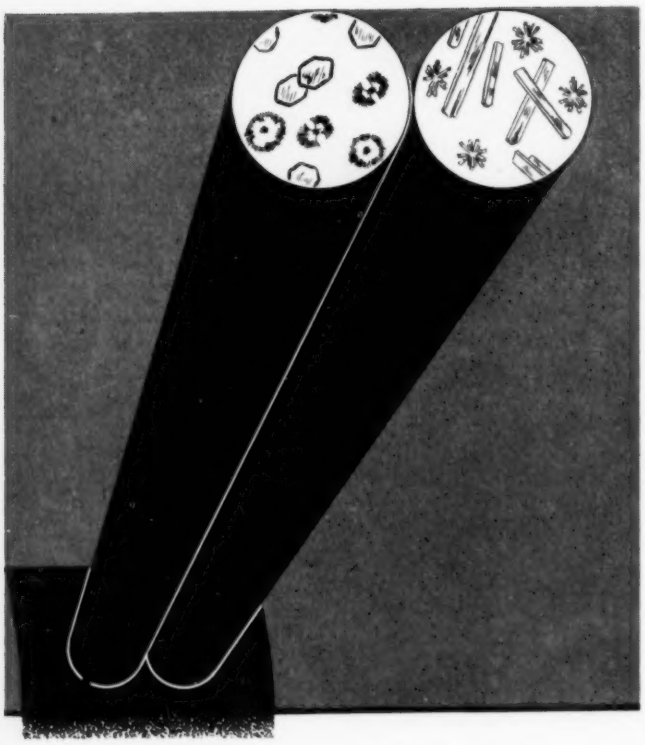
The value of Bausch & Lomb safety goggles in reducing eye injury is universally recognized. Their sturdiness and high impact resistance has made them the standard in those plants where the worker's safety is paramount.

Furnished with plano lenses or with prescription ground lenses to remedy unnecessary visual handicaps, they become a part of every worker's equipment—for better eye protection, better vision.

To help you in your safety campaign and supplement your efforts in conserving efficient visual standards, Bausch & Lomb is issuing a series of bulletin board posters stressing the importance of wearing safety goggles. The latest in this series, shown above, dramatizes the result of negligence and urges the use of safety goggles wherever eye hazards may be encountered. Its simple forceful message is one that workers will understand and heed.

A supply sufficient for your bulletin board requirements will be sent you on request. Their size is 13¾" x 21¾". Just write to Bausch & Lomb Optical Co., 602 St. Paul St., Rochester, N. Y.





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The topical use of the sulfonamide compounds is today an established therapeutic procedure in the treatment of open wounds, skin infections, burns and various dermatoses.

The method of application is, however, of great importance.

Thiasulfamix combines sulfanilamide and sulfathiazole in clinically effective proportions in a non-greasy, non-caking ointment of the ideal oil-in-water emulsion type.

The special base presents the sulfonamides in readily available form.

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Prescribe Thiasulfamix in 1-1/5 oz. tubes and 1 lb. jars.

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Industrial Hygiene

—Highlights in State Health Department Activities—

Alabama

DURING the calendar year 1943 the personnel of the Division of Industrial Hygiene of the State Health Department consisted of a physician serving as medical director, two chemical engineers, and a secretary. However, the requests made by industrial managers upon the division made it necessary to seek additional personnel. A chemist will be added early in 1944. An industrial nurse supervisor is provided in the budget and will be added as soon as a qualified person can be found.

The laboratory facilities were enlarged and improved so that qualitative and quantitative determinations of air contaminants and measurements of other toxic materials in the industrial environment could be accomplished; 398 samples and readings were analyzed during the year.

Visits were made by the director and engineers to industrial plants in cooperation with the Maritime Commission, the Army, the Public Health Service, the Alabama Industrial Relations Board, the Tennessee Valley Authority, and the personnel of state and county health departments. During these visits investigations and studies were made of establishments engaged in the manufacture of ships, textiles, iron and steel products, cement, chemicals, nonferrous metals and food.

A home nurse visiting service was inaugurated for absentees from the Tennessee Valley Authority industrial area, Wilson Dam Unit. This nursing service was rendered by the county health nurses of the two counties involved and in cooperation with the physicians and nurses of the T.V.A. This made possible other public health activities, including conferences with industrial physicians, nurses and other personnel concerned with plant medical departments.

Arkansas

ONE hundred and sixty-seven surveys, inspections and visits of industrial plants were made; these plants employed 18,236 workers. More than 5000 pamphlets, bulletins and posters were sent out from this office, and approximately 600 letters, and 98 reports were written. Recommendations for the improvement of the health and welfare of the workers were made in 85 plants involving 7865 workers. The recommendations were carried out in 43 plants involving 5094 workers, or 86% of all employees involved where recommendations were made.

A brief summary of the recommendations is as follows:

1. Improve medical and safety program in 23 plants. Examples: pre-employment and periodic medical examinations, chest x-rays, Wassermann tests, etc.

2. Improve sanitary conditions—80 plants. Examples: Install change-rooms, showers, washing facilities, sanitary foundations, paper cups, flush toilets, and septic tanks, etc.

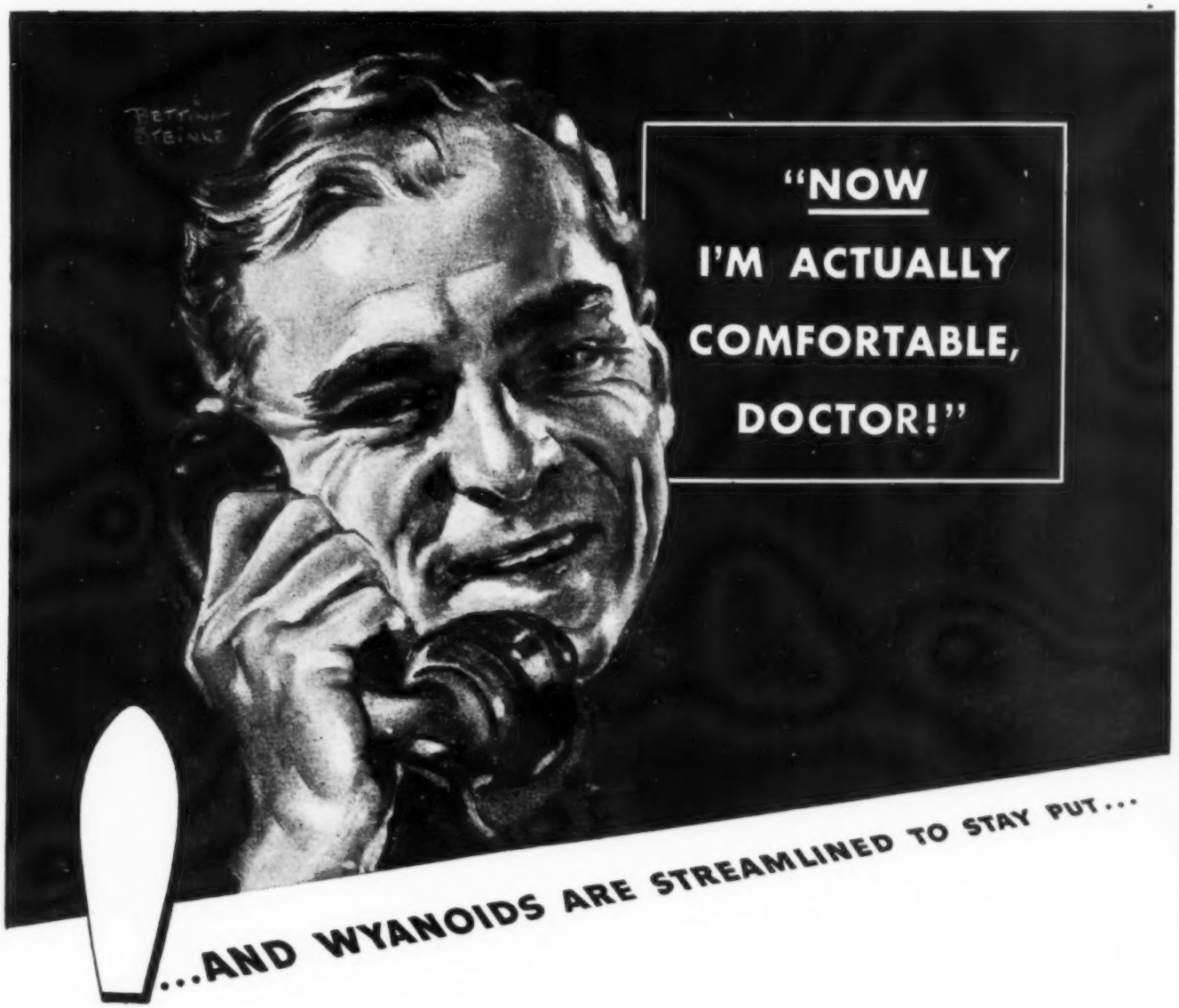
3. Specific environmental hazards—48 plants. Examples: Silica dust, lead, metal fumes, spray-painting, mercury, antimony, organic solvents, organic dyes and other dermatitis producers, gases, welding fumes, other chemical, etc. Recommendations made for specific hazards include protective clothing, goggles, protective ointment, improved ventilation, enclosure and exhaust, exhaust fans, positive pressure and respirators.

Connecticut

ACCOMPLISHMENTS: The following is a list of accomplishments of the Bureau of Industrial Hygiene for the calendar year 1943:

Field trips	1612	Field determinations	833
Visits to industry	1395	Laboratory determinations	6616
Plants visited	1200	Consultations	2401
Surveys	681	Lectures and radio talks	50
Studies	117		

PERSONNEL: The personnel of the bureau now includes one director physician, two industrial hygiene physicians, one industrial nursing consultant, six industrial hygiene chemists, four industrial hygiene engineers, one research



. . . in the treatment of uncomplicated, inflamed, painful, bleeding hemorrhoids not requiring surgical intervention. They are anatomically correct—easily retained above the anal sphincter.

After rectal operative procedures, Wyanoids are of service in allaying pain, controlling tenesmus, checking inflammation. In boxes of 12, with detachable label.

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—and **BEZON*** comes from Nature. It is concentrated from primary yeast, corn, wheat—natural sources from which come the Whole Natural B Complex.

Because B deficiencies are almost always multiple, authorities stress the importance of the ***Whole*** B Complex—certain factors of which cannot be synthesized.

BEZON contains no synthetic vitamin factors—it is ***Whole Natural*** Vitamin B Complex, concentrated to high potency from natural sources.

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assistant, one public health laboratory technician, and a clerical staff of seven. Of the above, one physician, a chemist and an engineer are lent to the bureau by the U. S. Public Health Service. Two physicians left the bureau during the early part of the year and another in August. Two of these three vacancies were filled in September. An industrial hygiene engineer left the bureau in August. This vacancy with filled in November.

FIELD ACTIVITIES: As during the previous year, the work of the bureau has been chiefly concerned with the study and control of health hazards in manufacturing plants engaged in war work. Some of more important investigations during this period were concerned with exposures to radioactive materials in dial painting and instrument manufacturing operations, the lead hazard in test firing ranges and in billet and bullet casting operations, the benzol hazard in rubber cementing operations associated with the manufacture of rubber boats and pontoons, chloronaphthalene exposure in the wire insulation impregnation operation, the silicosis hazard associated with the manufacture of quartz crystals for various electronic devices, dust exposures in mica mining operations, toluol and other solvent vapor exposures in spray painting, carbon monoxide in heat treating, fluorides in welding and magnesium casting operations, chromic acid in annodizing and chromium plating, silica dust exposures in grinding operations, and in the foundry and ceramic industries. Where workers were found to be exposed to hazardous concentrations of injurious materials, necessary measures for controlling the hazards were made and followed through to completion.

Laboratory space was increased during the year. The increase permitted a division of chemical and physical determinations, the latter, such as dust counting, calibration of instruments, analytical work involving use of the dropping mercury electrode, repair of instruments, etc., having been transferred to the physical laboratory.

Among the papers prepared for publication during 1943 were the "Outline of Some of the Potentially Hazardous Industrial Operations Encountered in Connecticut Industry," and a paper covering the "Relationship between Atmospheric Dust Concentrations and the Dust Content of the Coolant Liquid Used in the Manufacture of Quartz Crystals."

During the year considerable work was done on the study and control of industrial dermatitis, which included physical examination of the workers and analysis of numerous oil and solvent samples for skin irritants. An active program has been established to promote more complete recording of occupational disease cases and to improve medical and nursing facilities in industry. There were 55,316 serological specimens received from industry for examination in the program to control syphilis, and the Tuberculosis Commission made 13,682 x-rays of industrially employed persons in the control program for tuberculosis. These and other activities have been conducted in cooperation with Federal agencies including the Maritime Commission, the Army and Navy, and War Production Drive Committees.

Illinois

THE war industries in the state have presented many new industrial health problems. In general these are the result of certain special circumstances which can be briefly summarized as follows: (1) The use of new and unfamiliar toxic substances, some of which are required by War Department specifications; (2) the introduction of unsuspected health hazards resulting from the sudden use of unusually large quantities of toxic chemical substances, which in small amounts formerly presented no health hazard; (3) a reduction in air space per worker due to the increase in the number of machines and workers without corresponding increase in the size of the workroom, and so resulting in marked overcrowding; (4) location of plants in remote areas—far from eating facilities, hospitals or other industrial medical and nursing services, etc. The aforementioned have taxed the facilities and personnel of the Division because of the many requests for services. The combined efforts of the medical, engineering, laboratory, nursing and dental phases of our program are attempting to keep us with growth of industrial medicine and hygiene in our state.

While most of the activities have become routine service procedures, during 1943 special emphasis was placed on the following:

1. *Degreasing Solvents*—The Division studied 108 of the 500 units in the state. Over 400 samples were obtained while the machines were in operation. Good practice procedures were prepared and distributed.

2. *Radium-dial Painting*—There are approximately 500 dial painters in Illinois, mostly young girls. All the plants have been studied and the Division has instituted periodic breath samples for radon at regular intervals on those so exposed. The managements of all these plants are cooperating in this project.

3. *Industrial Feeding Programs* — Working with the State Nutrition Committee, many plants were visited which already had feeding facilities for workers or those that planned to institute same, and approved programs were outlined. This was accompanied by an extensive educational campaign.

4. *Industrial Nursing*—Our consultant visited several hundred industrial first-aid quarters or dispensaries staffed by registered nurses, and rendered valuable assistance. Many others were serviced by correspondence or telephone consultations. There are approximately 2500 industrial nurses in Illinois.

5. *Industrial Dentistry*—Our consultant assigned to this work has been studying the oral manifestations of occupational exposure by industry, e.g., confectioners, bakeries, cement, electrical equipment, etc. Other industrial manufacturing categories are being considered for further study.

6. *Mercury Exposure*—Working with the Navy Department, the Division has set up for them standards and good practices covering the environment and its employees engaged in a restricted war project which makes use of mercury. The standards we have prepared are being instituted in other plants which have contracted to take on similar production.

Kansas

THIS division was organized August 26, 1942, and is now located in the National Reserve Life Building, Topeka. The personnel of the division includes an engineer, chemist and doctor. The doctor, as director of the division is charged with the administrative duties of the division and also while in the field promotes a preventive medical program in industry and acts as consultant to industry in regard to matters pertaining to industrial hygiene. The engineer is charged with the responsibility of maintaining and operating all scientific equipment and using that equipment in industry for the purpose of taking samples of gasses, dusts, mists, fumes, and other hazardous materials which might affect the worker in his environment in the plant. The chemist has charge of the analyzing of the samples taken by the engineer and is responsible for the chemistry laboratory and its equipment.

The program is based on service to both industry and labor for the prime purpose of making the best over-all health program fit the industry. We offer, without charge, engineering and medical consultant services to all industries in the state. It is our purpose to promote a health program which will reduce absenteeism, increase production and effect a closer harmonious working relationship between labor and management. The engineering services consist of sampling atmospheric conditions within the plant, checking exhausts and other ventilating apparatus, checking lighting and all types of sanitary problems, and promoting a good safety program. The doctor's services entail promotion of immunization, vaccination, chest x-rays, serology and personal hygiene. In addition consultant services are given in regard to the setting up of medical records, pre-employment examinations, first aid stations, nursing problems, and occupational diseases.

Approximately 50,000 x-rays have been taken in industry with our 35 mm. photofluorographic unit. Out of this number about 1% has shown positive chest pathology of one type or another, and tuberculosis was manifest in about 0.6%.

DOCTOR: *"Take these two Anacin and you'll be back on the job in a jiffy."*

NURSE: *"These certain days needn't slow you up—Anacin works fast!"*

For the pains of minor neuralgia, simple headaches, and regular menstrual pains, Anacin offers medically proven ingredients in skilful combination.

Anacin is packed for industrial use in sanitary sealed envelopes for easy dispensing. 250 envelopes of Anacin for $2.83. Each envelope contains 2 tablets—about 1¢ a dose. Why not ask your purchasing department to order a supply of special industrial dispensing boxes for your use?

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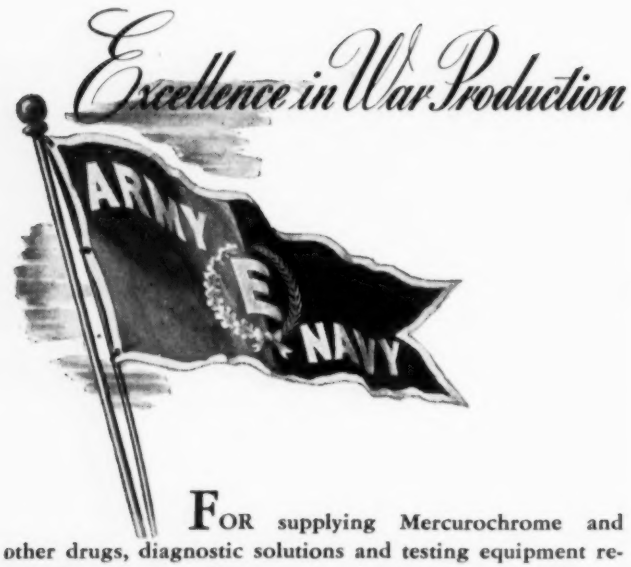

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The effectiveness of Mercurochrome has been demonstrated by more than twenty years of extensive clinical use.

For the convenience of physicians Mercurochrome is supplied in four forms—Aqueous Solution for the treatment of wounds, Surgical Solution for preoperative skin disinfection, Tablets and Powder from which solutions of any desired concentration may readily be prepared.

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The number of samples taken and analyzed comprise the following:

Carbon monoxide determinations	58	Zinc	6
Trichlorethylene	61	Cyanides	24
Benzol	40	Chromates	11
Lead	79	Nitrates	6
Hydrofluoric acid	8	Acid mists	8
Silica dust	53	Humidity	3
Carbon tetrachloride	15	Urine (lead)	1
Fluorides	40	Total	413

Louisiana

THIS was the second year of activity for our Section, and industry is showing an increased interest in our work. The number of requests for investigations shows a gratifying increase from 11 in 1942 to 31 during 1943, and requests for information have shown a corresponding or greater increase.

Activities were somewhat restricted during the latter half of the year, as our Industrial Hygiene Physician joined the Army Medical Corps in July and we have been unable to find another who is qualified to fill the position.

The educational program has been continued by giving lectures to various interested groups, particularly to safety engineering groups and classes of medical students.

Two papers were published: "A Study of Industrial Workers Exposed to Sulfur Dust," and "A Method for the Determination of TNT Derivatives in Human Urine."

During the year, more than 125 visits were made to 68 industrial plants, most of which are producing war supplies. Chest x-ray surveys were made in 12 of these plants through cooperation with the Tuberculosis Control Section of the State Health Department. A total of 13,437 x-rays were taken in these plants and classified as follows: 61 positive, 56 suspected, three undetermined, 108 for re-x-ray, and 13,209 negative. In some cases the plant paid for the follow-up studies and in other cases the worker was referred to his private physician.

Data reported by the U. S. Bureau of Labor Statistics indicate that during October-December, 1943, there were approximately 220,000 employees on the payrolls of manufacturing industries in Louisiana. This is 222% of the March, 1940, figure, when the last census was made.

The estimated budget for the 1944-1946 biennium is approximately $35,000. This does not include the salaries of personnel who are lent to the state by the U. S. Public Health Service.

Maryland

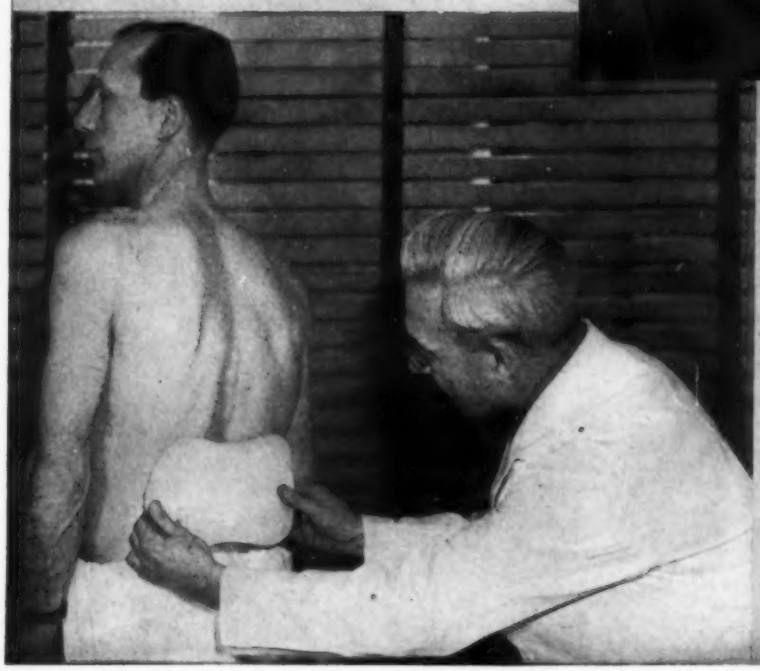
THE personnel for the year, remained the same as in 1942. It consisted of a physician director, an engineer, a chemist, and a secretary.

In reviewing the year's activities the most significant observation was that industrial management gave much more consideration to industrial health problems than previously. This can be attributed mostly to the fact that the industries are becoming acquainted with the work of the Division. During the year there were many requests from management for service which necessitated one or more visits to the plant. In addition, during routine visits to industries, advice and assistance of the members of the Division were requested on other health problems in the plant which developed subsequently to the previous visit. This type of consultation was not included in the records as request work.

During the year a new occupational disease report form which was brief and yet gave the essential information was developed by the Division with the cooperation of the U. S. Public Health Service. It was hoped that the form would induce the doctors to report more freely their cases of occupational diseases. To date very little benefit has been noted from the new form, although there have been a few cases reported which probably would not have been under the old method.

The problem of industrial nutrition was given consideration during the year. The State Nutritionist, during the summer months, visited several industries in regard to

When Muscle Pain Strikes



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The beneficial effects of this famous medicated plaster will help you keep down "man-hour" losses.

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Try a Johnson's Red Cross Plaster on one of your cases. We shall be glad to send you a liberal supply without charge.

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industrial nutrition. The work was instrumental in providing a dietitian in one plant, and also in assisting another industry in developing a cafeteria in the plant. A full-time industrial nutrition program in the State Health Department would be worthwhile, but the funds for such personnel are not available.

The direct services rendered by the Division to industries were 164 visits to 79 plants involving approximately 125,000 workers. The types of industries visited consisted of practically all types of manufacturing including coal mining. A total of 346 recommendations on industrial health problems was given to industry. Of these 92 have completed, 34 partially completed, 50 were not completed at the time of the last visit, and 170 have not been followed up.

An interesting phase of the year's work was a follow-up of recommendations given previously to 1943. There were 288 such recommendations. Of these 145 were completed, 29 were partially completed, and 114 were not completed. There was a total of 299 occupational disease cases reported during the year. Of these 72 were reported by physicians and 227 by the State Industrial Accident Commission.

As for industrial health promotion, assistance was given Johns Hopkins School of Nursing in developing a course on industrial nursing. Posters and pamphlets relating to health problems of the workers were distributed to many plants. A paper on dermatitis in a shipyard due to mahogany imported from South and Central America was written by the Chief of the Division in conjunction with Dr. Louis Schwartz, of the U. S. Public Health Service. The paper was accepted by one of the leading medical journals, but has not yet been published.*

Michigan

THE session of the State Legislature just recently adjourned has again granted the amount of $50,000 for our annual budget. This is an increase of $40,000 over two years ago. Our total budget for the ensuing year is $78,000. In addition, the total budget for the Bureau of Industrial Hygiene of the Detroit Health Department is approximately $40,000, making a grand total for the state of $119,000. While this is a vast improvement over that of two years ago, it still is not sufficient to cover the needs of the Bureau, but until such time as qualified personnel is available it will, perhaps, suffice.

The personnel of the State Bureau now includes two physicians, two chemists, two nurses, 11 engineers and two secretaries, making a total of 19. Two of these are lend-lease personnel from the U. S. Public Health Service. The personnel of the Detroit Bureau includes one physician, four engineers, three chemists and two secretaries. The physician with the Detroit Bureau is lend-lease personnel from the U. S. Public Health Service.

During the past year, the members of the State Bureau made 1700 plant visits and 718 plant surveys and studies. During the year, industry spent approximately $1,800,000 in complying with the recommendations submitted by this Bureau.

In addition to the central headquarters in Lansing, the Bureau maintains five district offices, with headquarters in Grand Rapids, Saginaw, Pontiac, Kalamazoo, and Ann Arbor. Three of these districts are staffed with one engineer, and two with two engineers. Consulting services are provided to these districts by personnel from the central office.

Minnesota

DURING the year 1943, 437 visits were made by the medical and engineering personnel of the Division to 116 different plants, employing approximately 72,000 workers. This is an increase of 48 man visits over 1942. One hundred and one of the visits to plants were made as part of the planned program of the Division; 236 were made as a result of requests from plant management; 42 resulted from requests from the Division of Accident Prevention, State Department of Labor and Industry; five resulted from requests from employees, 19 from requests from physicians, 11 from reports of occupational disease; and 23 resulted from requests from other interested sources. In other words, 77% of the work done was in compliance with requests, while 23% was done as part of the planned program of the Division. During 1942, 62% of the work was done in compliance with requests.

Ninety-eight of the man visits made during the year were in connection with 77 surveys of plants with possible health hazards; 260 of the man visits made were in connection with 81 engineering studies made of processes and materials to determine whether health hazards were present; 25 visits were made on medical studies; 39 on follow-up visits in reference to engineering studies made; and 24 visits on conferences with plant officials in regard to various industrial health problems.

The 81 engineering studies include 15 lead studies, 20 dust studies, 13 trichlorethylene and other vapors, five carbon monoxide, two metal fumes, three illumination, one welding fumes, one varnish, two ventilation, one acrolein, six physical environment, and one gaseous contaminant.

The Director of the Division visited 17 plants to discuss plant medical programs.

In the laboratory and field, 2,405 analyses were made, from 2,077 samples. This is an increase of 651 determinations over last year. The analyses included 752 dust determinations; 543 lead, zinc, iron and manganese fumes determinations; 88 gas analyses; 160 vapor determinations; 184 analyses of materials; 402 physical measurements; and 220 research analyses.

Of the 33 occupational disease reporting blanks received during the year, there were 14 lead poisoning cases reported, 11 dermatitis, three silicosis, three bronchitis from welding, one bronchiectasis, and one benzol poisoning.

The educational activities during the year were especially prominent; 107 hours were spent on lectures to students at the University of Minnesota, and other interested groups, nine papers were presented, and two papers were published.

The personnel of the Division attended 23 meetings with various groups in connection with the work of the Division.

DR. L. W. FOKER, Director of the Division, was appointed Chairman of the State Committee on Industrial Nutrition. Plans were made to assist industrial plants throughout the state with problems in nutrition.

Also during the year 1943, there were 107 requests for information received by the Division.

The personnel of the Division consisted of the following: one public health physician; four public health engineers, one of whom joined the staff in June; one chemist, and two clerk-stenographers, one of whom was placed on the staff in October.

New Hampshire

ACCOMPLISHMENTS: Visits were made to 185 industrial plants with a total employment of 47,514; 54 mica mines and rifting sheds with employment of 640; surveys of industrial plants, 115; consultations, 33; laboratory determinations, 175; field determinations, 65; lectures and radio talks, 10.

One interesting survey was made at one of our larger paper pulp industries, with approximately 1500 people given chest x-rays, blood tests, urinalyses, and dental examinations. Several other plants have since had mass x-ray surveys, with standard size plates being used. In all, slightly over 3000 x-rays have been taken of industrial workers.

A nursing consultant has been added to the Division, whose major activities have been concerned with tuberculosis x-ray survey programs and as a consultant to industrial nurses of the state. The nursing service has been favorably received by the physicians and nurses in industries.

Considerable attention has been given to industrial nutrition problems by our State Nutritionist, and all plant cafeterias are routinely checked.

A labor management committee was formed late in the year in one of our large companies periodically to inspect

*This report is dated as of March, 1944. See "Dermatitis from Mahogany Wood," by STARLING D. STEINER, M.D., and LOUIS SCHWARTZ, M.D., *Industrial Medicine*, March, 1944, p. 234.

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In war, even more than in peace . . . dispenser of blessed relief . . . his the precious power over pain.

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To simplify your treatment of

INDUSTRIAL ECZEMAS

Nason's

INDIVIDUAL TREATMENT KIT

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The new SUPERTAH Kit is designed to make it easy for the busy Industrial Physician to dispense or prescribe this White, Non-Staining coal tar ointment in treating the eczematous dermatoses encountered among war plant workers. Each Kit contains a 4-oz. bottle of LOTOKAL (Nason's Calamine Lotion) for bathing affected areas, a 2-oz. jar of SUPERTAH Ointment (either 5% or 10% strength as ordered) and complete but easy-to-follow directions. Your patient thus always has at hand the complete treatment and can easily follow your instructions. This convenience, plus SUPERTAH'S ease of application and freedom from the disagreeable qualities of crude black coal tar preparations, help to secure the patient's cooperation with minimum supervision.

SUPERTAH Ointment (Nason's) has Many Obvious Advantages

SUPERTAH (Nason's) is a white, creamy ointment prepared from a concentrate of crude coal tar, uniformly milled in proportions to equal either a five (5) or ten (10) percent crude tar ointment with these advantages:

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various parts of the plant and make recommendations to improve the health and safety of the workers. This committee has been very succesful. Plans are being made to form similar committees in other plants.

FUTURE PROGRAM: (1) Continuation of services to war industries; (2) increasing the industrial x-ray program in cooperation with the New Hampshire Tuberculosis Association; (3) continuing development of the industrial nutrition program; (4) forming of more labor management committees on other plants throughout the state; and (5) further cooperating with the medical and nursing societies, labor organizations, manufacturing groups, and other interested committees and organizations.

North Carolina

THE greater part of our work in Industrial Hygiene for the past year has been of the routine type which has consisted largely of the examination, both physical and x-ray, of the employees of the various mining industries throughout the state.

Among these, the mica industry has perhaps been the most outstanding. This is true because of the fact that this state produces between 50 and 75% of the entire sheet mica output of the United States.

Aside from this routine work, three other matters of interest have been dealt with: (1) Assistance has been rendered at various times to the shipyards, munitions plants, and other war industries which have sprung up during the past two years; and (2) considerable work has been done in the examination and evaluation of the results among the employees of the asbestos textile industries. This work is still in progress and we hope to bring out a report at a later date. The third matter of interest was the work among 42,000 industrial employees by means of chest x-ray and tuberculosis surveys. These surveys were conducted in various counties of the state and in various types of industries in an effort to obtain a fair cross section of the incidence of tuberculosis among our industrial population. A summary of the results of these surveys was reported in our Health Bulletin in December, 1942.

Ohio

DURING March and April, 1943, the personnel of the Industrial Hygiene Unit of the Ohio State Department of Health, which had consisted only of an industrial hygiene nursing consultant, was increased by the addition of one physician, one engineer, and one chemist, supplied on loan by the U. S. Public Health Service.

The educational activities inaugurated were extended to include lectures by the added personnel. The groups to which these talks were delivered varied in character but included four series of lectures to industrial nurses' organizations in different areas of the state, and single addresses to a large number of professional groups. These latter groups were made up of physicians, safety engineers or personnel managers, as well as a number of those who were attending scheduled meetings of official or non-official health agencies.

In-plant professional services were rendered to numerous industries in connection with suspected occupational hazards or known health problems. During the first half of the year, the engineering service was limited to a visual inspection service, owing to the lack of field equipment which was unobtainable on account of shortage in supply. Although not all the equipment ordered had been delivered by the end of the year, there was sufficient to have allowed several hundred samples to be analyzed.

Sources of in-plant activity included private requests from manufacturers, requests from local health officers, and referrals from several governmental agencies. The largest number of this latter group came from the Continuous Security Branch of the Army and represented plants which had already been inspected by inspectors from their Health and Safety Division. To facilitate accuracy in the reporting of suspected conditions by these inspectors, field demonstrations and classes were held with them by both the medical and the engineering personnel of the Industrial Hygiene Unit.

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BECAUSE WE REALIZE

that the best interests of patients require that they receive advice on matters pertaining to health from qualified physicians only, we confine all advertising on our gynecological products to physicians and the druggists who serve them.

Careful consideration of all the features of the "RAMSES"* Flexible Cushioned Diaphragm will, we believe, satisfy the physician that the interests of the patient are served best when "RAMSES" Diaphragms are specified.

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The Ohio State Medical Society inaugurated a program of industrial health and invited cooperation from the Department of Health. As a result, personnel from the Industrial Hygiene Unit assisted in the preparation of a manual, which was distributed to all medical society members, entitled "Fundamentals in the Organization and Operation of an Industrial Health Program by a County Medical Society."

Plans were also laid for a series of meetings to be held in the four large population centers of the state under the joint auspices of the State Department of Health and the Ohio State Medical Society. These meetings were to be addressed by three prominent out-of-state industrial physicians as well as by members of the state and local Health Departments and the local medical societies.

Through the State Department of Health, arrangements were made whereby the U. S. Public Health Service supplied a portable x-ray unit for a tuberculosis survey carried on cooperatively by the official and non-official health agencies of Cleveland. This program began its operation in December with requests for x-rays already on file for over 150,000 employees in the area.

Oklahoma

A QUARTERLY report of the activities of the Division of Industrial Hygiene was prepared for the period of January through March, 1943, inclusive. This report indicated that inspections were made and suggestions offered to plants and agencies receiving war contracts. Visits and investigations were made at the Oklahoma City Air Depot and the Tulsa Plant of the Douglas Aircraft Company, Incorporated. Lectures were given in industrial hygiene engineering and plant or public health medicine to two classes (one each) at the State University and the Oklahoma A & M College. A two-day industrial health meeting was held in Tulsa and Oklahoma City in cooperation with the State Medical Association. No report is available for services rendered during the period April through July, inclusive, owing to military leaves and resignations.

An industrial hygiene physician was assigned to the Department by the U. S. Public Health Service in August. Beginning in August and extending through December, surveys were made in 51 business establishments, employing 28,500 workers. Forty of these surveys involved medical facilities of the particular establishments, and 11 pertained to environmental and workroom conditions and hazards. Confidential recommendatory reports were furnished the managements of these establishments.

Twelve laboratory determinations were completed during the period August through November. Nine talks, covering various phases of industrial medical hygiene, were delivered, to approximately 570 people. Thirty-nine interviews were held in connection with and following these meetings. In the course of making medical surveys in some 40 business concerns, varying situations were discovered. In general, it may be stated that a thorough-going, up-to-date plant medical program was lacking in the great majority of the plants visited. Many of the concerns do make use of the different methods in their medical procedures, which are considered to be standard practice. Few companies, however, go all the way in providing an all-coverage program.

An x-ray screening survey to discover pulmonary tuberculosis was recommended to 38 concerns. As a result of this suggestion, nine requests involving 1247 workers have been received for this service. One survey, with the use of the miniature 35 mm. film, has been completed at the State Health Department. A great deal was learned in this latter survey as to the proper technique and methods needed. Forty abnormalities of a moderate degree were disclosed in this study, and the involved workers were informed and advised, where the findings indicated a need for further medical study by the private physician.

Eight forms and leaflets pertaining to industrial hygiene subjects were prepared for public distribution.

Replies were prepared for quite a number of consulting letters, telephone consultations were held, and numerous office interviews in addition to the above.

Oregon

SURVEYS: 181 surveys of 36 specific industries; chest x-ray of 30,000 shipyard workers by the Division of Tuberculosis.

STUDIES: Carbon tetrachloride; epidemic of gastro-enteritis involving 2,000 workers in a shipyard.

ADMINISTRATIVE: Division of Industrial Hygiene was established by the State Board of Health in October, 1942. Investigative, educational and advisory program established. Development of x-ray program in industry. Cooperation with city and county health officers, medical departments of various industries, labor organizations, and the State Industrial Accident Commission, and other state agencies.

EDUCATIONAL: Industrial hygiene course at University of Oregon for graduate industrial nurses. Lectures at Oregon Medical School.

LEGISLATION: Occupational Disease Law providing complete coverage effective July 1, 1943.

Pennsylvania

DURING 1943, personnel of the Bureau of Industrial Hygiene of the Pennylvania Department of Health made a total of 7,712 visits to industrial plants employing 1,853,456 persons. Investigations of hazards were made in 7,146 plants and included inspections, preliminary surveys, consultations, and engineering or medical studies. Workers subjected to the hazards investigated numbered 1,552,755.

Recommendations for the improvement of hazardous conditions, affecting 61,330 workers, were made in 728 plants, and it was found that 379 plants had complied with recommendations previously made, thereby affecting improved environmental conditions for 22,073 employees.

Samples of toxic materials collected for analysis totaled 636, and 775 laboratory determinations were made on these samples.

An advisory report, dealing with toxic material, concerning which a request for information was received, was prepared and submitted.

The Bureau was represented at 19 meetings or conferences of various organizations interested in the promotion of industrial hygiene activities, and 11 lectures on problems of industrial health were given by members of the Bureau personnel to medical students, nurses, labor unions, and other groups throughout the state.

Literature on venereal disease was provided for 2,734 plants, and distributed by them to approximately 88,000 employees.

During October, the Bureau personnel was augmented by the addition of a dental consultant and a staff nutritionist. These two fields are particularly important in any industrial hygiene program under present conditions, and the Bureau is thus enabled to enlarge the scope of the services it provides.

Rhode Island

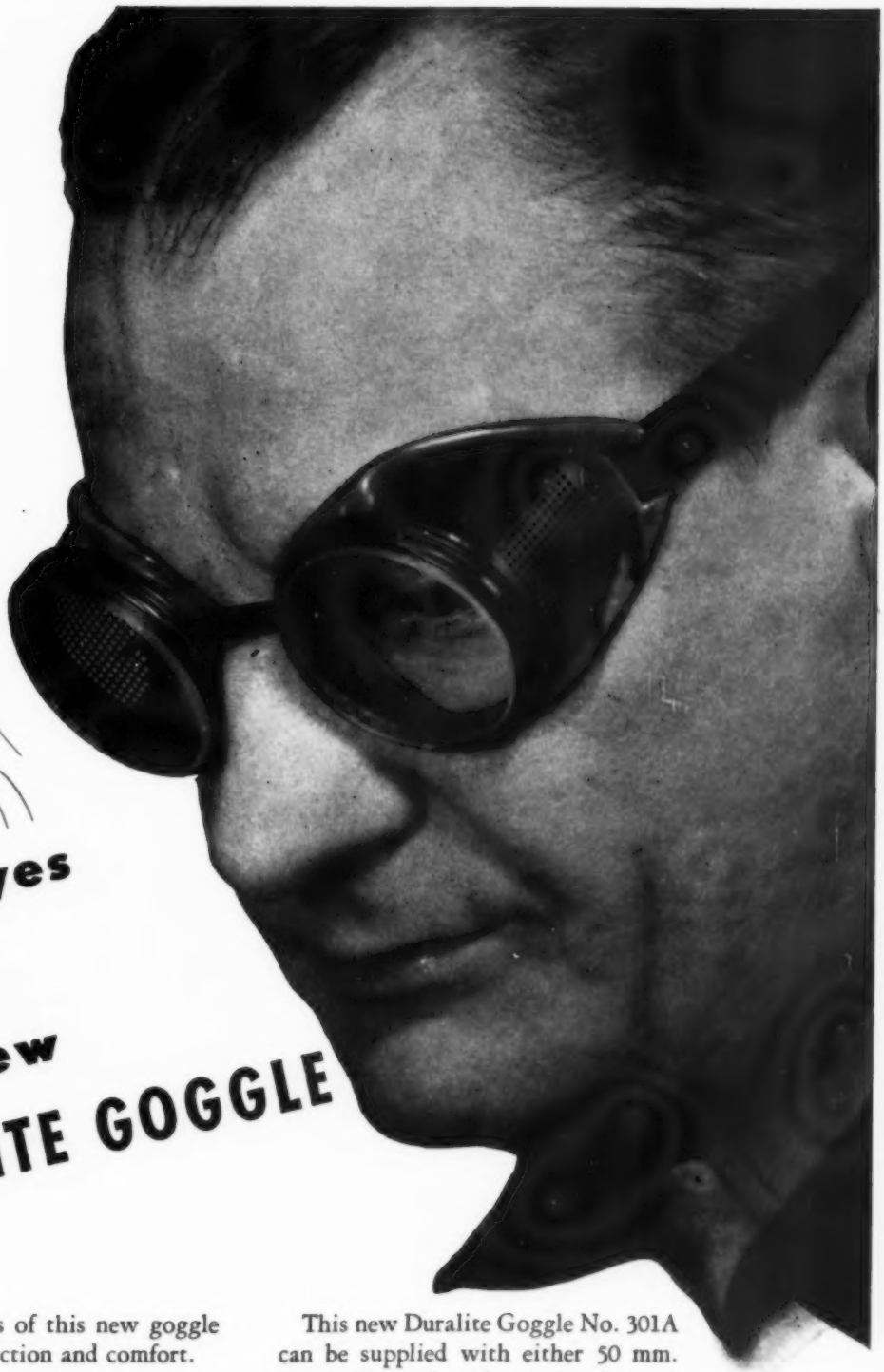
PERSONNEL: One medical director; one industrial hygiene engineer; one clerk-typist.

OCCUPATIONAL DISEASES REPORTED—43: Dermatitis, 31; lead poisoning, two; silicosis, two; undulant fever, one; acute yellow atrophy of liver (death—halowax), one; other, six.

PLANT STUDIES MADE—153: Employees directly affected, 13,877.

SOURCES OF REQUEST FOR STUDY: Self-initiated, 87; Department of Labor, four; management, 11; labor, three; plant physicians, 25; private physicians, 21; private citizens, two.

The most important activity of the year was an Industrial Health Institute held in May, 1943. This culminated in the formation of the Rhode Island Society of Industrial Physicians and Surgeons, and the Rhode Island Industrial Nurses' Club. These two groups have held monthly meetings throughout the year and each is now affiliated with a national organization, giving some assurance of their permanency. The physicians' group has 64 members; the nurses' group 54. These societies have proved to be excellent avenues for disseminating industrial hygiene in-



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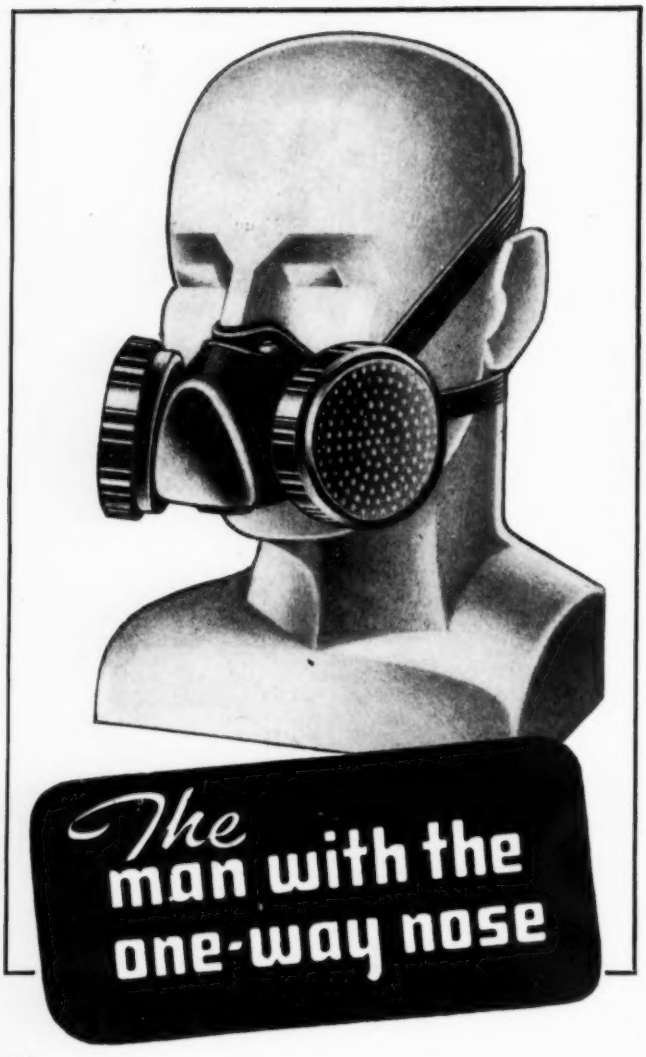

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Always breathing in one direction, he comes in mighty handy when respirators are to be tested. Put one on him and he'll inhale tainted air as long as his colleagues wish, while they measure and record the respirator's performance.

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formation and bolstering such programs within the plant.

The number of industrial nurses increased from 44 to 142 during 1942, and to 164 in 1943.

The division has cooperated with the Providence Tuberculosis League in arranging mass chest x-rays for 4,000 employees in four plants in the Greater Providence Area, and has been instrumental in having similar surveys done by private roentgenologists in many other plants.

Memberships and committee appointments in the following local organizations have served to further the objects of this division:

MEDICAL DIRECTOR:

Committee on Tuberculosis, Providence District Medical Association.

Steering Committee, Consumers League of Rhode Island.

Executive Committee, Health Council, Providence Chamber of Commerce.

Secretary, Committee on Industrial Health, Rhode Island Medical Society.

Chairman, Committee on Industrial Feeding, Rhode Island Nutrition Council.

Secretary, Rhode Island Society of Industrial Physicians and Surgeons.

Chairman, Industrial Health Section, Civilian War Services.

Member, Health Section, Providence Council of Social Agencies.

INDUSTRIAL HYGIENE ENGINEER: Secretary, Rhode Island Society of Professional Engineers; Gas Control Section Civilian Protection Services, State Civilian Defense.

Tennessee

THE program of the Industrial Hygiene Service was confined to engineering and nursing activities during the period covered by this report, owing to the shortage of trained personnel. The engineering activities were curtailed somewhat during this period since the Service was without an engineer for approximately six months. There was no medical personnel in this Service during this period.

Engineering services were rendered to a total of 45 plants having a total population of 73,873 workers. On the 45 visits, engineering studies were made in eight plants, inspections were made in 11, and consultations were held with plant managements in 23. Reports were prepared of the engineering studies, and recommendations were made for corrections of harmful working conditions in eight plants.

Nursing services were rendered to 84 plants, involving a total of 112 plant visits. As a result of these, 57 nursing reports with recommendations were prepared and presented to the plants involved. Twenty-nine of the plant visits were made as a result of requests, and the remainder as part of the planned program or for purpose of follow-up.

A program of absenteeism reporting for industries in the state was initiated during this period. Plants representing various types of industries were selected for study, originally involved nine separate plants. These nine plants employed a total of 11,280 workers. At the present time seven plants are regularly reporting absences to this Department. Regular analyses are made of data received, and individual plant reports are prepared periodically and forwarded to the management.

Educational talks have been presented to various organizations, and members of the staff have participated in extension courses for nurses, presented by a school of nursing of the state.

Texas

INDUSTRIAL HYGIENE activity in Texas was accelerated during 1943 under a four-point program which included:

1. Field investigation of industrial plants for occupational health hazards and recommendations for corrections.
2. Laboratory and analytical service, to determine the extent of hazards.
3. Health education and promotional activities directed at workers, plant management, and the general public.
4. Cooperation with other bureaus and agencies.

When politeness doesn't pay

Too often patients feel obliged to suppress the normal urge for evacuation while visitors or even physicians are present. When privacy is finally gained, the stimulus may be gone. Another movement has been skipped!

Since absorption of fluid continues in the large bowel, the stool progressively hardens so that when evacuation *is* attempted, it may require painful straining and irritate tender tissues. This in turn aggravates the constipation, and the familiar cycle begins.

'Agarol' Emulsion holds moisture in the stool, provides soft bulk to keep it well formed, eases its passage, and mildly stimulates peristalsis. 'Agarol' Emulsion does this with finesse—providing the minimal stimulus needed for evacuation. And with 'Agarol' Emulsion there need be no griping, no leakage.

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Phenolphthalein in an Emulsion of Mineral Oil, an Agar-Gel, Tragacanth, Acacia and Egg-Albumen.

The work was performed with an organization consisting of four engineers in the field, one engineer and one chemist in the central office and laboratory, one secretary, and specialized consulting service from physicians in other bureaus and divisions in the State Department of Health.

ACTIVITIES AND HIGHLIGHTS CLASSIFIED:

Plants visited	848	Public addresses and lectures	131
Laboratory tests	418	Papers for publication	4
Requests for service..	122	Literature distributed (pamphlets) 2,500	

It has been estimated that about 35% of the recommendations which were made have been accomplished.

Advisory Standards for Industrial Sanitation in Texas Industries were prepared and approved by the Texas State Board of Health.

The Texas Legislature approved and made an appropriation for a budget which included industrial hygiene personnel for the first time.

ENVIRONMENTAL SANITATION: Industrial hygiene personnel assisted in the promotion of environmental sanitation programs in industrial areas. These programs involved typhus control, aedes egypti control, water supply and waste disposal, and garbage collection. Special emphasis was placed on the work following hurricane damage in part of the Gulf coast industrial area, and during the drive to control poliomyelitis during the summer. In at least one instance, panic of industrial workers in the poliomyelitis area was averted.

INDUSTRIAL NURSES: Incomplete results of the annual survey of nurses to date revealed 199 industrial nurses in 43 plants of Texas. Assistance was given to the Industrial Nurses Society in the Houston Area, where 102 nurses are employed in 33 plants. The Nursing Division of the Texas State Department of Health promoted an industrial nursing institute in Texas after two of the staff nurses had completed the 10-day Industrial Nursing Institute in Bethesda, Maryland.

INDUSTRIAL NUTRITION: Industrial hygiene personnel introduced the industrial nutritionist of the Food Distribution Authority to a number of Texas plants, thereby initiating a survey of industrial feeding problems. A nutritionist of the State Department of Health assisted with the opening and initial operation of one plant cafeteria.

DERMATITIS: DR. LOUIS SCHWARTZ, Chief, Dermatoses Investigation Section, U. S. Public Health Service, spent two weeks in Texas visiting plants, holding clinics at requests of plant physicians, and conducting seminars before meetings of local dermatologists and other medical groups.

EDUCATION: A series of classes on "Industrial Sanitation" were initiated and taught by industrial hygiene personnel in Houston. At the request of the Eighth Service Command Headquarters, industrial hygiene lectures and demonstrations were presented before a number of safety classes for civilian employees at Army posts, camps and stations. Special papers were presented before the Illuminating Engineering Society, Industrial Nursing Institute, plant protection clinics, and county medical societies.

IN-SERVICE TRAINING: All industrial hygiene field personnel spent some time in the laboratories of the State Department of Health and received latest information on occupational disease control. All five engineers received certificates for the completion of a 92-hour E.S.M.W.T. Safety Course. Schools and conferences attended by industrial hygiene personnel included Civilian Defense Against War Gases; Annual Conference of Governmental Industrial Hygienists, Rochester, New York; Conference with Maritime and Navy Shipyard physicians and agents in New Orleans; and one representative of the laboratory visited the Industrial Hygiene Division of the State of New York and the National Institute of Health in Bethesda, Maryland.

COOPERATION WITH OTHER AGENCIES: Eighth Service Command Headquarters, U. S. Army—field testing and laboratory service was provided in several plants; Maritime Commission; State Labor Department; Federal Labor Department; CIO; Texas Manufacturers Association; Federal Housing Authorities; and Office of Civilian Defense.

In 1944 we expect to continue our four-point plan of operation, paying special attention to the critical war industries.

Utah

A TOTAL of 49 industrial hygiene engineering surveys, of mines, mills, smelters, industrial plants, arsenals and depots, to determine safe working conditions for 48,971 employees, were conducted in 1943 by the Division of Industrial Hygiene, State Department of Health. Common toxic substances found in the atmosphere of the working establishments were lead, sulphur dioxide, arsenic, zinc, trichlorethylene, carbon monoxide, carbon dioxide, methane, and hydrogen sulphide. In addition to the independent tests conducted by the Division in plants, samples were submitted to the chemical laboratory. These number 500 for chemical analyses, and 500 for total dust counts.

Also during the year the industrial hygiene physician and consultant industrial hygiene nurse contacted 35 industrial establishments, both private and governmental, to promote a more effective medical and nursing service.

Vermont

THIS department, like most other similar departments in other states, has concentrated largely on health services to war industries for the past year. Every industry with a new war contract has been inspected and the services of this department have been offered.

In several of our more important war industries, we have inaugurated pre-employment x-ray services, done by this department, and, in three of the larger plants, there has been a program for the routine serological testing of employees.

Plant cafeterias have been re-checked in regard to both sanitary facilities and health of personnel. Advice from the state nutritionist has also been availed of by many of these cafeterias.

It must be stated that the control of specific hazards has been made somewhat difficult by the loss of our engineer in June to the State of Washington. As yet, it has been impossible to secure another trained man in this field. However, the Public Health Service kindly lent us an industrial hygiene engineer who thoroughly checked the granite sheds in regard to their dust control. This of course is still the greatest single hazard in the State of Vermont. In general the conditions were found good; however, the same engineer is to return in the spring to check the sheds again. This service is continuous in normal times.

X-ray clinics for granite cutters are run regularly, and any cutter in the state may have a free chest x-ray at any time.

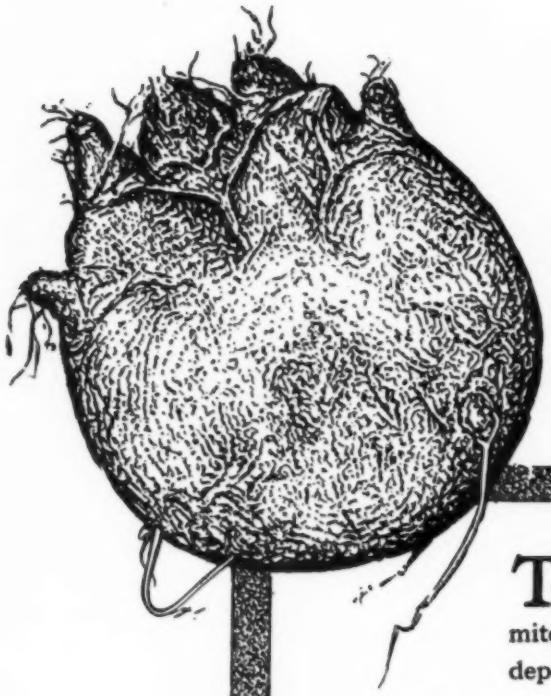
Three war industries have requested general x-rays on all plant personnel. This was done on a voluntary basis, and approximately two-thirds of the personnel in these three plants were x-rayed. Two of these industries were definitely connected with occupational hazards, one being a copper mine and the other a foundry.

There has been added to our staff a part-time consulting industrial nurse from the Public Health Nursing Division, who is contacting our rapidly increasing number of industrial nurses in this state in regard to general health programs, first aid, etc.

Owing to the lack of an engineer and also the fact that roughly 90% of the loss of time in industry is due to causes other than occupational, it is felt that the concentration on general health programs will be increased. It has been found that when a good general health program is started in a plant, frequently the specific occupational hazards are taken care of automatically with only slight stimulation from this department.

Washington

NINETEEN FORTY-THREE was the first year of operation of our Division of Industrial Hygiene since it was established in October, 1942. A considerable portion of the year was spent in organizing the Division, obtaining personnel and equipment, setting up policies and establishing relationships. The time thus spent has proved to be an investment which is now paying dividends. An example of



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The parasiticidal effect is due to the presence of benzyl benzoate, the active principle of Balsam of Peru. Exhibited in a 25% emulsion it not only eradicates the parasite but aids in healing any superimposed dermatitis.

Simple treatment: a hot bath, apply **BENZAMOL** to lesions, let dry and make second application; a hot bath and complete change of clothing after 24 hours is usually sufficient.

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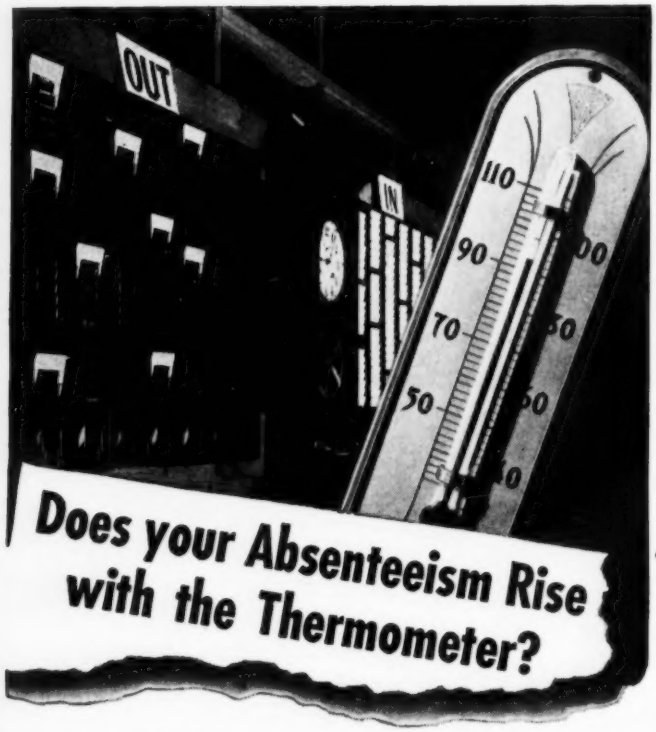

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A rising temperature and a rising number of absentees usually go together. One reason is sweat.

Sweat robs the body of essential salt. This loss of salt dehydrates the body. It thickens the blood. Throws body fluids out of equilibrium. The result is Heat-Fag. Workers are tired, easily fatigued. They lack the "drive" that keeps production soaring.

Water alone can't replace the fluids lost through sweat. Water alone in hot, sweaty conditions dilutes body fluids and causes heat cramps.

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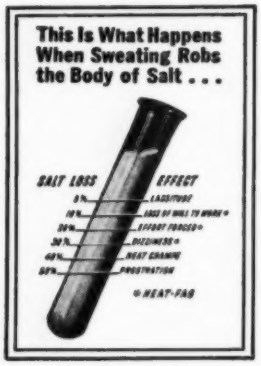

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Case of 9000, 10-grain salt tablets - - - - - - $2.60

Salt-Dextrose tablets, case of 9000 - - - - $3.15

MORTON'S Heat-Fag SALT TABLETS

Morton's Dispensers

They deliver salt tablets, one at a time, quickly, cleanly—no waste. Sanitary, easily filled, durable.

800 Tablet size - - - $3.25

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this, we feel, was having the "Statement of Policy of Industrial Hygiene Advisory Committee" endorsed by the State Federation of Labor. This represented a reversal in this state of labor's attitude toward physical examinations.

The professional staff of the Division was increased during the year from two persons to seven, and two others are expected to report early in 1944. The present technical staff consists of two physicians, two engineers, one nurse, one industrial hygienist, and one chemist. Additions contemplated are one physician, one industrial hygienist, and one industrial hygiene inspector. The Seattle City Health Department started an industrial hygiene program and employed an industrial hygienist who is assigned to our Division, where he works essentially as a member of the Division. He and the industrial hygiene inspector above referred to are included in the list of technical personnel.

Activities in industrial plants followed along the lines in general practice in most states. Considerable work was done in shipyards, and aircraft and aluminum plants since a large number of the war workers of this state are employed in those industries. Many other types of industries also received medical, nursing and engineering services.

West Virginia

PERSONNEL: One physician-director; one industrial hygienist; one secretary; one industrial hygiene engineer; one industrial nursing consultant; one janitor.

SURVEYS AND INSPECTIONS: 70 plants inspected or surveyed. Health recommendations made affected 25,000 workers. Emphasis has been placed on war industries and those having war contracts. There has been slow but steady increase in interest in industrial health and hygiene, as evidenced by the increasing number of requests for services of this Bureau arising from management.

EDUCATION: Professional personnel continued to give talks and papers to lay and professional groups. The industrial nursing consultant was added to the personnel early in 1943 and since that time has aided the industrial nurses in organizing groups and helped them in attempting to render a uniform program to the industries to the fullest extent of their abilities.

PUBLICATIONS: A bulletin outlining the services of this Bureau and a discussion of the hazards of sewer gas and the control of these hazards were published. Two other bulletins were prepared but have not yet been published. The most important needs of the industries remain the same as in the past: (a) adequate sanitary facilities; (b) adequate first aid equipment, and medical and nursing services; and (c) good housekeeping and adequate illumination.

British Columbia

INDUSTRIAL hygiene programs have been established in all our shipyards in British Columbia, employing full-time physicians and nurses who are working in cooperation with the City Health Department and utilizing as well the V.D. and T.B. diagnostic and treatment services of the Provincial Board of Health.

In addition other large war industries are covered. The local health departments are utilizing their facilities to cooperate with the industries and are more or less dealing with the major problems occurring from time to time.

The Dominion Government provides a chemical engineer trained in industrial chemistry who is located in laboratory space provided by the province. This man assists all the industrial hygiene program.

In connection with the V.D. and T.B. programs, extensive industrial educational attempts have been made to reach as many of the workers as possible. We have a traveling chest clinic which visits all the large industries and has completed chest examinations on most of the employees in the Greater Vancouver area.

[NOTE: The foregoing "Highlights in State Health Department Activities" should be read in connection with the editorial on page 406, and the editor's note on page 418.]

MIDDLE AGE, INDUSTRIAL EMPLOYMENT *and Nutrition*

The sudden change from sedentary life to active employment necessarily requires many adjustments in employees of middle age. Not the least important among these are the changes in eating habits that must be made if full industrial productivity is to be expected. A greater caloric intake is obviously needed, but in addition, all other nutritional requirements must be met to prevent premature fatigue and frequent layoffs.

As a beverage and a snack during rest periods, Ovaltine serves a dual purpose. Not only is this delicious food drink refreshing and a ready source of caloric food energy, but it also provides a wealth of the essential nutrients required in greater amounts during periods of increased physical effort. Three glassfuls daily, in addition to the average dietary, virtually assures complete satisfaction of all nutritional requirements.

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Ovaltine

Three daily servings (1½ oz.) of Ovaltine provide:

	Dry Ovaltine	Ovaltine with milk*		Dry Ovaltine	Ovaltine with milk*
PROTEIN	6.0 Gm.	31.2 Gm.	VITAMIN A	1500 I.U.	2953 I.U.
CARBOHYDRATE	30.0 Gm.	62.43 Gm.	VITAMIN D	405 I.U.	480 I.U.
FAT	2.8 Gm.	29.34 Gm.	THIAMINE	.9 mg.	1.296 mg.
CALCIUM	.25 Gm.	1.104 Gm.	RIBOFLAVIN	.25 mg.	1.278 mg.
PHOSPHORUS	.25 Gm.	.903 Gm.	NIACIN	3.0 mg.	5.0 mg.
IRON	10.5 mg.	11.94 mg.	COPPER	.5 mg.	.5 mg.

*Each serving made with 8 oz. of milk; based on average reported values for milk.

INDUSTRIAL HEALTH and DISEASE

Industrial Medicine

—A Little-known Specialty Shows Its True Importance in the War Emergency—

THE recognition of industrial medicine as a true specialty with a well-defined field of its own has been long delayed in the United States. This branch of medicine was well established in Europe even before the war of 1914-1918, but on this side of the Atlantic, even today, there are many misconceptions as to the functions and the aims of the industrial physician. Some still identify him with the industrial surgeon, who received cases of industry injury from a certain number of industries in his neighborhood, or who regularly performed operations on injured men insured by one or more insurance companies. Others mistakenly look on him as a sort of "house physician," treating minor ailments in some industry as a side line to his regular practice. He has still to be clearly seen by all in his real role as organizer and adviser chiefly concerned with the *prevention* of accidents and disease.

To fulfill these functions properly, the industrial physician must acquire special knowledge and skill which fully entitles him to be regarded as a specialist. He must be a good enough toxicologist not only to recognize the action of poisons already known to science, but also to track down and identify new toxic materials which are especially prone to appear in industry in these days marked by exuberant chemical development. He must be engineer enough to recognize dangerous physical conditions and structures before they fail and cause accidents, chemist enough to have clearly in mind the relations and differences of the myriad chemical compounds used in modern manufacturing, executive enough to organize workable systems of hygiene and inspection, and diplomat enough to deal easily both with top management and with rank-and-file labor.

However widespread former misconceptions conerning the industrial physician may have been, the large industries in which this specialist has developed his skill to a high point have long since recognized how indispensable such counsel is. Thus, in the present war emergency there was considerable consternation when the nation-wide American Medical Association questionnaire revealed only 1,177 specialists devoting their full time to industrial medicine. The tremendous expansion which was contemplated when that survey was made seemed impossible to many unless a relatively equal expansion of trained industrial physicians could be achieved.

If one puts himself in the place of a manufacturer about to undertake the production of new articles on a huge scale, it is easy to see the tremendous problems which might arise. Let us suppose that alloys of new and unfamiliar metals are to be handled. New fluxes, cutting oils, adhesives and paints may be required. How is the manufacturer to foresee what poisonous effects all these unfamiliar substances may have upon the workmen? How is he to guard against these effects even if he knows about them in advance? Who is to tell him whether his men are being made ill by some noxious material encountered at work or whether they are ill from some other cause? Obviously, only a physician who has devoted some years to a study of industrial poisons and their effects will be able to foretell the hazards of the known toxic materials.

Of still greater importance, however, is the fact that the specialist in industrial medicine is prepared to identify a completely new poison in some hitherto-untried process; to trace the poison to its source, explain its action, and recommend measures for eliminating it. Without prompt advice of this kind, some new projects could certainly never be carried out without endless delays and much needless suffering.

In the case of a large industry, the price of ignorance with respect to the laws of industrial toxicology is so great that it is small wonder large manufacturing businesses have made extensive use of expert advice in this respect. In the same way they have found it necessary to employ experts in other fields to avoid equally large losses due to faulty engineering, inefficient accounting, and the like. The small manufacturer is not likely to find his losses so large from any of these causes, though proportionately they are even greater. He, therefore, is less disposed to consult experts, in addition to being unable to afford their services on a full-time basis. Sappington* estimates that 95% of the industrial establishments in the United States are not provided with competent medical supervision of the specialized industrial type, and that these small plants employ about half of the workers of the country. Thus, the greatest need for improvement is generally found in the manufacturing establishments which employ less than 1,000 workmen; plants which are of larger size have, generally speaking, made wider use of specialized industrial medical service.

At the present time, most competent authorities agree that the only way in which good industrial medicine can be brought to the small plant is by a better standard of industrial practice for the general practitioner. It is not enough for him to think in terms of classical plumbism, mercurial poisoning, and the like. He must spend enough time in the small establishments he serves to get an adequate idea of the processes and exposures which occur there, and he must then supplement these observations with study of the literature to learn what morbid effects might be produced in workmen by the operations which have come to his attention. Finally, he must so orient his picture of each individual patient that he sees the man not only against the usual background of home environment and heredity, but also against the truly important background of the occupation which supplies the environment for one-third to one-fourth of his active life.

The general practitioner, when first his interest is aroused in industrial diseases or occupational poisonings, must circumvent a treacherous pit-

From *What's New*, March, 1944, published by Abbott Laboratories.

SAPPINGTON, C. O. (1943), Essential of Industrial Health, Lippincott, Philadelphia.

MUCOUS MEMBRANES

are delicate

They should be treated carefully.

Harsh solutions can be exceedingly harmful.

NO FEAR OF IRRITATION

when

ALKALOL

is used.

This bland alkaline saline solution dissolves mucus, cleanses and soothes the membranes, yet is always safe to use freely.

For the eyes, nose, throat; or as a wet compress in the treatment of minor burns, common skin irritations, etc.

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West Durma-Gard Protective Aprons, Arm Guards, Coveralls and Overalls are made of a light, strong base fabric treated on both sides with especially processed plastic which definitely resists absorption, penetration or saturation of solvents, oils, acids and other materials commonly used in industry. They afford workers an exceptionally high degree of protection against the irritants and most injurious chemicals, dust, vapors, etc., that cause industrial dermatitis.

West Durma-Gard Protective Garments offer the following important advantages

1. Resistant to oils, acids and chemicals. **2.** Resistant to dusts and powders. **3.** Resist absorption. **4.** Withstand solvents. **5.** Light in weight — comfortable. **6.** Adjustable Arm Guard Sleeves for ventilation (fit any wrist). **7.** Washable in soap and water.

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fall: that of diagnosing one of these unfamiliar diseases without adequate evidence. It might be taken as a good general rule that no such diagnosis should be made merely on the basis of the workman's own description of his occupational environment. If the practitioner would go into the factory to see for himself just what the working conditions are, he would make a diagnosis far more satisfactory to himself, and much more likely to stand up under adverse criticism, than one made "by the book and the patient's story." The small manufacturer should welcome factory inspections of this kind, especially if these can be made the basis for helpful recommendations by the physician, leading to better factory hygiene. For improved hygiene is often a matter of insignificant cost which brings about improvements in workmanship and production.

In this age of technological advancement, materials are coming into everyday use which were curiosities kept in laboratory bottles only a few years ago. Chemistry is spawning new substances faster than any ordinary mortal can keep track of their properties. The inevitable result of this "march forward" is that poisonous materials will fall into the hands of those who have no inkling of their danger. An interesting instance of this kind is the use of cadmium instead of zinc in the production of a special-purpose galvanized pipe. The zinc-galvanized and cadmium-galvanized materials are not dissimilar in appearance. Recently a piece of cadmium-coated pipe fell into the hands of a workman who decided to produce a flange on one end. He took another tool which was ready at hand, the oxygen-acetylene torch—an engine having many unsuspected hazards all its own—and proceeded with his work. The cadmium coating vaporized and created a fume, which he breathed. Zinc will do the same, but zinc has been worked for a hundred years or more. As a result of this exposure, the workman quickly sickened and died, a victim of technological progress which outpaces education.

In the feverish development of metallurgy excited by the current war, many new and highly poisonous metals are being incorporated into alloys which in a few years will become common articles of commerce. Magnesium, beryllium, selenium, tantalum, and many others, have come out of laboratory bottles into foundry ladles and machine shops. When uninformed mechanics begin tinkering with these alloys in their shops and garages, some very unpleasant things may occur. The same is true of the organic solvents, now thrown upon the market in such profusion, confusion and admixture that only the expert can determine what is dangerous and what is not. There is every reason to believe that the old natural oils, resins and minerals used for painting and protecting surfaces for hundreds of years—materials which finally became known to the common man, along with their dangers—will be supplanted by ever-changing and ever-"improved" synthetic materials dissolved in a bewildering number of new organic solvents. These can be expected to penetrate finally to the smallest industries, and unless some way can be found to diffuse toxicologic knowledge as rapidly as modern advertising diffuses toxic products, damage is bound to be done. This is a task which the general practitioner must undertake. In doing so, he will greatly profit by utilizing some of the special techniques which the specialists in industrial medicine have developed. He will wish to become familiar with some of the methods of air-analysis, and will perforce be required to consult some of the compendia of toxic materials furnished by the voluminous literature of the specialty. He may have to disinter some of his long-unused skills and perform certain chemical analyses which the clinical laboratories available to him are unable to accomplish. His organic chemistry will probably require a little rejuvenation, and he will have to remember some of the physics of air-currents and the flow of fluids in ducts. Altogether, it might be a welcome change from the uncertainties of biology.

Since the growth of industry into fairly large aggregates is an historical phenomenon extending over several centuries with no sign of slackening or waning, and since the industrial environment is coming to play such an important role in the life of every citizen—even supplanting, in some countries, the role of the home—there is every reason to expect for industrial medicine an increasingly great and important future. The industrial physician of today, a member of a specialty still in the formative period, will have an important influence on the standards and ideals to be set for the industrial doctor of tomorrow. It is essential that these principles should be sound and of the highest ethical merit so that the traditions which have cast so much luster on the past of Medicine may continue to flourish in this new branch in the future.

Industrial Toxicology vs. Industrial Psychiatry

W. E. DOYLE, M.D.,
Director, Bureau of Industrial Hygiene, Kentucky

THE NEED for making a fine distinction in diagnosis between industrial intoxication, or the results of exposure of the individual to industrial poisonings, both acute and chronic, and the neuropsychiatric state is more noticeable today, during the extremely heavy production necessity of industry, than ever before.

This applies not only to the individual but also, in some cases, to all the employees or to certain groups in a plant. This was emphasized in our experience recently in a plant in Kentucky, where it was feared the employees were being subjected to toxic amounts of carbon monoxide in the air. The onset of this episode was acute, occurring during the night shift of a plant employing predominantly women workers. Some of the women began complaining during the middle of the night of headache and dizziness and one or two of them became semiconscious. Over a period of five or six hours, some seven or eight women were removed from the work room to a lower floor front office, well ventilated. As the number increased, they were removed to a local hospital. It was noted that some of the women, while waiting for the ambulance and after having been revived by fresh air, "fainted" again when other women were brought through the room in which they were sitting, although obviously no exposure could have been present as all windows and doors were open. I myself noted the incident of three girls who were refused admission to the plant upon coming on their shift and who never actually got inside the plant at all, but took themselves to a nearby delicatessen store where they were told of the incident by girls who had been there the previous night; whereupon, these three girls, one by one, pro-

In *Bulletin of the Department of Health*, Kentucky, March, 1944.

COOPER CREME
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HERCULES KNEW THE POTENCY OF

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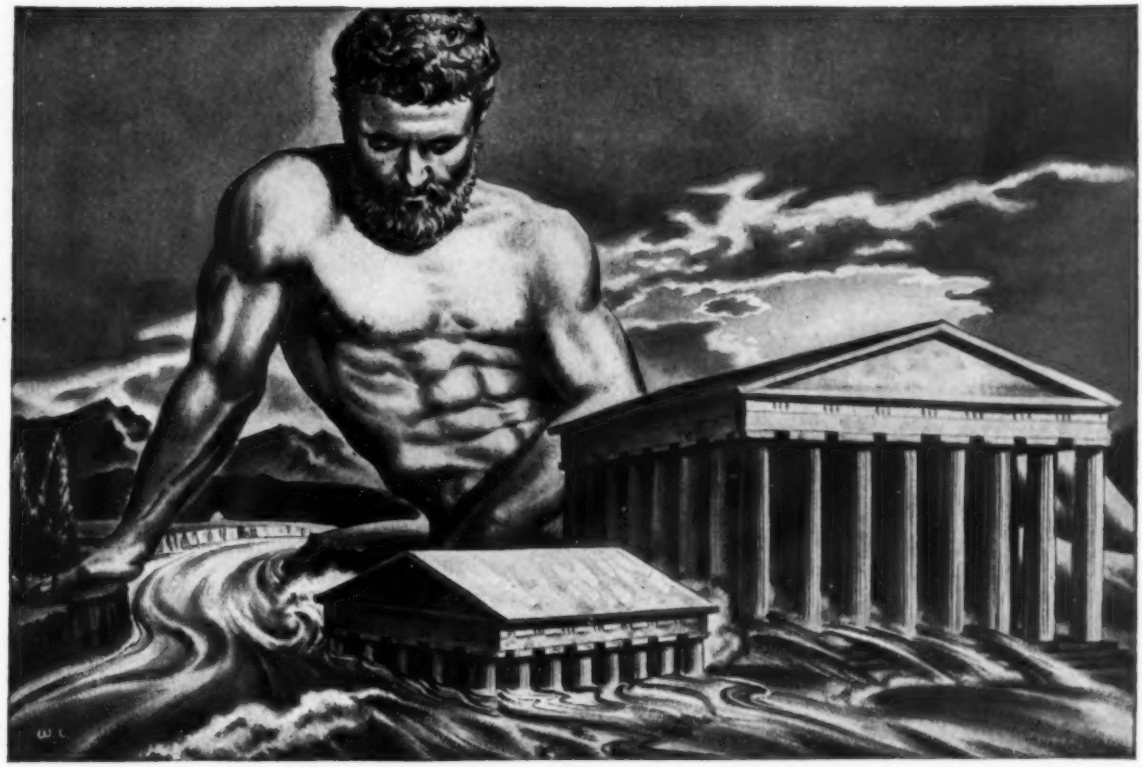

WHEN commanded to clean the stables of Augeas, where 3000 oxen had been kept for many years, Hercules solved this stupendous problem in one day by diverting the rivers Alphaeus and Peneus to run through the waste-laden stables.

Similarly, in the intestinal tract, there is no more efficient method of flushing away waste than by the use of *liquid bulk* —as formed by Sal Hepatica plus water.

Clinical and laboratory tests prove that:

★ in the isolated loop of a dog's ileum, a laxative solution of Sal Hepatica increased the liquid bulk by 34 per cent in one hour.

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★ Sal Hepatica's liquid bulk helps stimulate bowel muscles, maintain a proper water balance. And the salines of Sal Hepatica relieve gastric acidity, promote the flow of bile.

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TO HELP FLUSH THE INTESTINAL TRACT

Sal Hepatica SUPPLIES Liquid Bulk!

ceeded to "faint." Obviously, this was purely mass hysteria, although it was difficult to separate the neurotic from the intoxicated. Consequently, the work of the attending physicians was delayed and complicated, inasmuch as it was necessary to take blood from all and all bloods had to be subjected to laborious and prolonged laboratory work in order to separate those truly affected. A thorough and painstaking history on each case would have obviated much of this unnecessary work and delay. The employment of great numbers of women in industry today emphasizes the psychological problem more clearly. Regardless of whether females are more susceptible to psychoneurotic complaints, it nevertheless remains true that women, as a group, are more highly attuned, nervously, than are men. Probably the true psychiatrics, the subnormal mentalities and the psychopathic personalities do not vary between sexes in proportion to the numbers employed, but of the industrially maladjusted they constitute the largest and most important group and include more women than men. Many factors probably contribute to this, those of anxiety and malnutrition as well as those of menopause and overstressed emotional compensation for physical defects and dysfunctions. The industrial physician does not need to be a psychiatrist and does not necessarily need special training, other than that of sympathetic understanding and careful attention to detail, to remedy much of this situation within industrial organizations. He can listen and he can diagnose industrial trouble spots, such as environment, fatigue and group maladjustments. He can recognize the maladjusted types and can advise transfer or outside therapeutic treatment. Indeed, he can do much in the way of education of the employee in the simple principles of mental and physical hygiene.

Health Problems in Oregon

—Committee on Industrial Health—

SINCE the tremendous expansion of defense industry throughout the country, industrial health has come to occupy a prominent place in medical interest. In the State of Oregon, previously not so highly industrialized, this transition has come with overwhelming suddenness. The profession has had to meet many medical problems with which it was unfamiliar. However, it has been assisted greatly by the recent publication of many live articles in medical journals and books pertaining to health in industry and its various phases. Reference to these is recomemnded.

In some parts of our country a vigorous campaign has been conducted to induce industry to have its own private plant physicians. However, this is rather contrary to the regular practice followed in Oregon, therefore, little emphasis has been placed on this phase.

Periodic inspection of plants, and lectures and demonstrations by medical men to management and employees on health hazards and sanitation have been strongly recommended. However desirable such a procedure may be, with the shortage of overworked physicians such an effort seems impossible. In a commendable way the Oregon State Board of Health has endeavored, during the last year, to fill the breach by the employment, first of DR. HAROLD CASTBERG, and, at present, of DR. THOMAS F. MANCUSO, from the U. S. Public Health Service, whose duties are as above mentioned.

The action taken by the 1943 Legislature in making occupational diseases coverable has added greatly to the complexity of the duties of physicians, and promises much confusion and controversy until the provisions of the act have been clarified and are better understood by all parties.

It may be forecast that a just evaluation of a case by a physician is very likely to produce a difference of opinion between patient and physician, to the detriment of his practice. Fortunately, however, at the present time, the profession is in such an independent position that it need not equivocate.

This committee report is an expression of the opinion of its members, based upon personal experience in the field, and a consideration of the latest literature on the subject, by the best authorities. Some of these health hazards will now be discussed in more detail.

Health Hazards in Welding

ONE of the first of these is chest disorders, accompanying welding processes.

Metal fume fever, zinc "shakes," is now quite clearly defined entity, characterized by sudden onset, chills, vomiting, etc., lasting a few hours or days. The attack confers some immunity. There are no permanent organic changes in the lungs, nor any increased susceptibility to tuberculosis.

This commonly occurs to new workers who have been exposed to a high concentration of vapor for a short time. A more serious type of lung trouble is likely to follow the inhalation of noxious fumes from coated rods, acid metal cleaning baths, etc., such exposures depending, of course, upon the concentration of the fumes which may conceivably lead to pulmonary edema, pneumonitis and death.

In the evaluation of these cases many factors will have to be considered, such as small working places like those in the fore and aft peaks of a ship; crowding of workers; herding of workers in transportation facilities; unsanitary housing conditions; the ever-present epidemics of influenza and pneumonia associated with wartime conditions.

It is quite probable that, under the new occupational disease law, the differentiation of those etiologic factors will be one of the biggest, serious headaches for the physicians and the State Industrial Accident Commission.

It would seem that there is yet the need of much more study, including animal experimentation to determine the toxic limits of such noxious vapors.

Shipyard Dermatoses

IT IS likely that many substances used around defense plants may cause irritation of the skin in those individuals who may be susceptible or allergic to them. Among these may be mentioned cable insulation of chlorinated naphthalenes and phenols; fiber glass used for insulation; carbon tetrachloride with cutting oil; and various other substances, not overlooking the everpresent scabies which may have been the exciting factor.

Eye Disorders

FLASH burns are often due to carelessness on the part of the worker in leaving off the goggles or shields.

Foreign bodies are so common that nurses remove many of them, which practice should probably be discouraged, especially imbedded foreign bodies. In this connection it could be suggested that more general practitioners should qualify themselves for doing this type of work.

The epidemic, keratoconjunctivitis, is not necessarily occupational. It belongs to the virus diseases, like virus pneumonia. Recent reports show that convalescent serum may cut its duration by half.

Sterilizing Effect of the Arc Flash

THIS ghost which occasionally arises has been very effectively laid. When one realizes that in ordinary roentgen work 100,000 to 200,000 volts are commonly used; there could not possibly be any roentgen rays developed in the 20 to 80 volts ordinarily used in welding, not even cumulative effects.

Pre-placement Examinations

IN THE Atlantic, Gulf and Great Lakes regions, pre-employment and pre-placement examinations are in order. It may not be generally known by the profession that, under the master agreement between the U. S. Maritime Commission and the labor unions on the Pacific Coast, it is stipulated that as a prerequisite to employment there shall be no physical examination nor age limit except such as is required by law. So the gates are down to the aged, coronaries, chronic ulcers, cancers, diseased flotsam and jetsam which has gravitated to our state from the four corners of our country.

DR. COURTLAND L. BOOTH, Chairman, in *Northwest Medicine*, February.

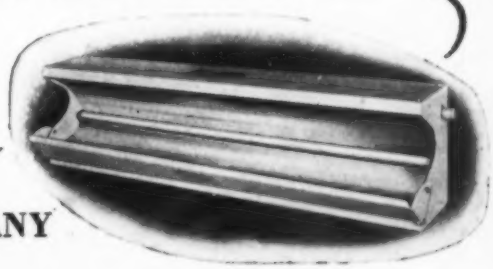
Outstanding for their efficiency and economy ratings . . . for their safety, compactness and simplicity of operation, Hygeaire Units are potent destroyers of air-borne infectious bacteria and viruses. Radiant ultraviolet germ-killing energy at its best.

Investigators have shown that expelled droplets from coughing and sneezing evaporate quickly and the droplet nuclei . . . the infectious bacteria . . . are rapidly conveyed by natural currents from room to room, from-floor to floor, as living particles of dust. Destruction of such air-borne organisms is rapidly accomplished by Hygeaire germicidal energy.

Ultraviolet germicidal protection is doing a full time job in many industrial plants on the production front. It has been found an effective means of reducing absenteeism due to cross-infection and epidemic spread.

INVESTIGATE HOW HYGEAIRE PROTECTION CAN HELP TO MAINTAIN PRODUCTION SCHEDULES

Your medical director may consult his preferred dealer or write us direct.



AMERICAN STERILIZER COMPANY
Erie, Pennsylvania

There is no present method, then, by which it may be determined that the type of work which a person may be doing is harmful to himself, or that he may be a menace to his fellow workman. It is obvious that something should be done about this. Ordinary common sense demands it; the occupational disease law demands it; any prepaid system of medical care and hospitalization should demand it.

It would seem that the Oregon Physican's Service is in the best position to enforce such a demand. We need only to look forward to the end of the duration when the patriotic stress to work is removed, when the let-down comes. Then this avalanche of infirmities will be loosed upon us with wrecking effect. Here will be the great opportunity for socialized medicine. Let us forestall it by taking the shock in stride.

The new roentgen unit now being installed by the Oregon State Tuberculosis Association for the examination of chests of workers is a very timely step. This is capable of being operated at the rate of 2000 per day. The blood tests for syphilis would be an easy further step. Examinations such as these, whatever the cost and by whomsoever paid, would be a fine investment.

Gynecologic and Obstetric Aspects

DEFINITION *of the Field:* The committee is investigating the significant cause and effect relationships between gynecologic conditions, including (a) menstruation, (b) the menopause, (c) gynecologic and pathologic conditions; and obstetric connotations, including (a) fertility, (b) pregnancy, (c) the puerperium, (d) lactation, in connection with the stress and strain involved in the heavier wartime occupations now imposed upon women.

2. *Object of the Study:* This study is undertaken in the interest of (a) the health and well-being of workers, in so far as the gynecologic and obstetric aspects are concerned, (b) the promotion of efficiency in production, a study and recommendations relative to absenteeism from the above-mentioned causes, (c) correlation of all data, and preparation of a unified and coordinated plan for general use in the interest of all of the above-named factors.

3. *Method of Study:* A bibliography has been carefully prepared. Consultations have been held with all available authorities, including industrial health executives, industrial nurses and counsellors, personnel executives, efficiency men and representatives of labor unions. Conditions have been observed first hand. Systems in this interest, now in action, have been carefully scrutinized. Individual workers have been seen as patients and cases in point specifically studied in these interests. A unified and coordinated plan for general use, prepared on the basis of these data, is very nearly ready for presentation, but must be released through agencies other than this committee and this Society, contingent upon prior liens.

4. *General Comment:* The bibliography, background authorities, matters of precedent in this field are extremely foggy. A very careful inventory reveals little of value. Beyond this, studies of existent plans proves them to be crude, poorly integrated, different in nearly all existent setups, inefficient and, in the main, scientifically worthless. This part of the study indicates that a single, entirely new and unified approach is required; that such an approach is perfectly possible and, in fact, desired and acceptable by all agencies involved, although it has not been until the present time; that the incorporation of such a unified program will unquestionably be the greatest possible boon in the interests noted above.

5. *The difficulties*, which have stood in the way of the proper conduct of these matters in the past, have been (a) the minor proportions of the problem (women have only recently come prominently into the heavy industries), (b) the absolute opposition of labor unions to pre-employment physical examinations, (c) the unwillingness of women, themselves, to jeopardize their chances of employment on the basis of some physical impairment, (d) the hesitancy of employers to insist upon aggressive measures in so delicate a field, (e) the lack of knowledge or precedent. Practically all of these objections have now been ironed out or overruled; the field lies open for intelligent action.

6. *Pre-employment Physical Examination, Records, etc.* A thorough gynecologic examination, including obstetric aspects, is the absolute basic factor in the correction of this entire situation. Such examinations are part of the program in a number of forward looking industrial set-ups at the present time. Although their use and the arrangement of the contingent data has been entirely helter-skelter, the tremendous attendant advantage is already exceedingly obvious. Lessons learned in the organizations which have adopted this program are available for a new and more unified set-up, which this committee is making the object of its study. It should be clearly understood that pre-employment physical examination is absolutely basic. This subcommittee recommends, to begin with, the unqualified approval of the incorporation of such a program in every industrial set-up using women in heavy work occupations. The employers are ready and willing to assume the cost of this undertaking. Further details in the presentation of a unified plan should not, at the moment, be the obligation of this subcommittee.

Children's Nurseries

IT IS felt that nurseries at the plant, except, for those children residing in the immediate locality, are undesirable. It is believed that the hazards of transporting children with the already overcrowded facilities to and from such places, early and late, and in all hours, would more than offset any benefit derived from such presumably better staffed and serviced nurseries. As a solution of this problem, we would recommend the increase of properly inspected neighborhood residence nurseries in addition to the school nurseries already in existence.

We believe that the above is in agreement with the conclusions of the Oregon State Committee on Child Care, Health and Welfare, which has been seriously wrestling with this nursery problem. To be effective, however, a campaign to secure such homes should be immediately instituted.

In conclusion, we would recommend a neutral panel of physicians to pass upon requests for change of employment.

These are but a few of the activities which might be considered by a Committee on Industrial Health.

BOOKS

Miners' Diseases

THE HISTORY OF MINERS' DISEASES—A Medical and Social Interpretation, by GEORGE ROSEN, M.D., with an introduction by HENRY E. SIGERIST, M.D. Cloth, 490 pp., price $8.50. Schuman's, New York, 1943.

THE material in this volume is divided into two parts, the first considering the subject from the neolithic times to the end of the 18th century, and the second including the 19th century with respect to morbidity, mortality, pathology and nosography, therapy and prophylaxis, and the beginnings of social and protective legislation.

A comprehensive bibliography of 261 references is a part of the text, and there is a good index of subjects and personal names.

Mining, being one of the oldest and most important industries, has provided in this volume an excellent example of the importance of interpreting medically and socially the diseases occurring in one of the most important industrial groups. Because the history of occupational disease is concerned with infinitely more than medical history and because hazards and diseases change in developing industry, whether any use was made of medical knowledge did not depend so much upon the physician as on the social organization under which the laborer performed his work. These considerations make the book an outstanding reference volume with respect to these corollaries of occupational medicine. There is thus provided, as the author states in his preface, a "basis for the genetic understanding of this field of medical endeavor."

DR. ROSEN expects at some future date, under more propitious circumstances; to write a history of miners' diseases during the first four decades

Doctor: We want you to taste this palatable soda tablet

℞

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SIX GRAIN
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Trade Mark Reg. U.S. Pat. Office
For the Treatment of
INDIGESTION
PROPERTIES: Antacid, Anti-Flatulent, Carminative.
DOSE: Two to five tablets dissolved in the mouth or in severe cases in glass of hot water.
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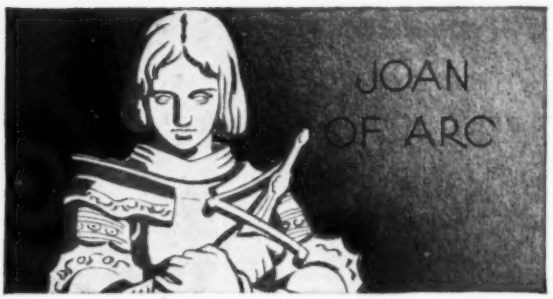

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Roentgen Diagnosis

Review by
JAMES T. CASE, M.D.

THE ARTHROPATHIES. A Handbook of Roentgen Diagnosis. By ALFRED A. DE LORIMER, A.B.; M.A.; M.D., Colonel Medical Corps, United States Army; Commandant, The Army School of Roentgenology, Memphis, Tennessee. Formerly Director of Roentgenology, Army Medical School, Washington, D. C. Three hundred and nineteen pages; 678 illustrations. Chicago: The Year Book Publishers, Inc., 1943. Price $5.50, postpaid.

A WELCOME addition to the literature of roentgenology is presented in this concise, though well illustrated, text on the roentgen aspects of joint disease. The amount of text is minimal. The illustrations are numerous, and are especially satisfactory because of their reproduction in the negative, thus resembling the original films and more acceptable to the average reader than the print in which the shadows are shown as positive or black shadows.

The author divides the book into Part I, dealing with peripheral joints, and Part II, dealing with the joints of the spine. The peripheral joint lesions are differentiated into specific and non-specific osteochondropathies and development anomalies; a group in which the changes are especially concerned with mechanical stress, and a group in which protein reaction, toxins or actual bacterial invasion are primarily concerned. This latter group constitutes the true arthritides. The joints of the spine are given especial consideration.

The author very properly emphasizes that an evaluation of the roentgen evidence concerning conditions in and about joints depends upon a substantial knowledge of embryology and an understanding of the anatomical relations and of the pathological changes which must be associated with the roentgenographic interpretations.

Manual on Tuberculosis

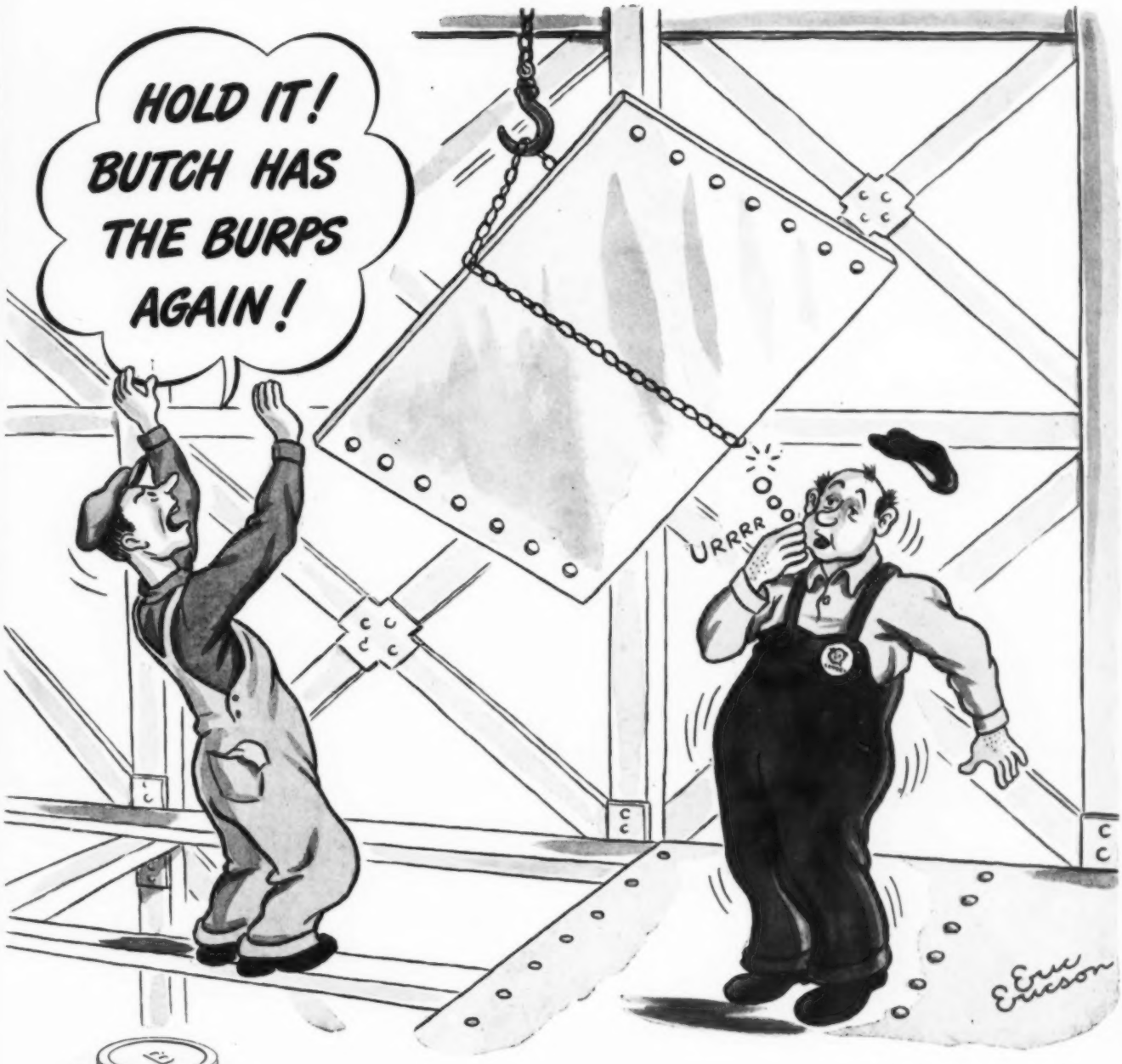
Review by
JAMES T. CASE, M.D.

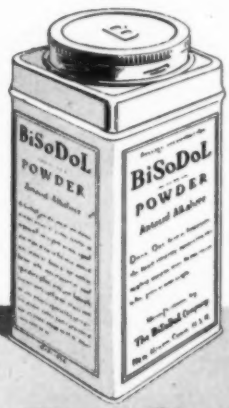
A MANUAL OF PULMONARY TUBERCULOSIS (PART I). AND AN ATLAS OF THORACIC ROENTGENOLOGY (PART II). By DAVID P. N. LINDBERG, M.D., F.A.C.P. Lecturer on Tuberculosis, State University of Iowa, College of Medicine; Director of Roentgenology, State Sanitorium, Iowa. Two hundred and nineteen pages, plus index, with 44 figures (Part I) and 145 plates (Part II). Springfield, Illinois: Charles C. Thomas, 1943. Price $6.50.

IN PREPARING this work the author intended a handy manual covering the practical phases of pulmonary tuberculosis, both briefly and in sequence, making it a ready reference guide in the diagnosis, treatment and prevention of the disease. Such phases of the subject as relate to allergy, immunity, resistance, and morphology are omitted because these subjects are not yet on a sound basis; investigations continue in these fields. The text is limited to those phases of the subject of pulmonary tuberculosis which are not theoretical, experimental, or controversial. Special attention is given to the newer evaluation of physical signs, fluoroscopy, roentgenography, including the conventional as well as body section radiographic methods.

The atlas of chest roentgenograms provides a series of films arranged in order of sequence, illustrating the diagnosis, the differential diagnosis, and the results of treatment of pulmonary tuberculosis. The publisher is to be congratulated on the excellent reproductions.

Your reviewer's criticism of the book is that the text on roentgen interpretation, with which he is most familiar, is much too brief and would not permit a non-expert to read chest films accurately. The illustrations, however, are numerous, well selected and well reproduced.





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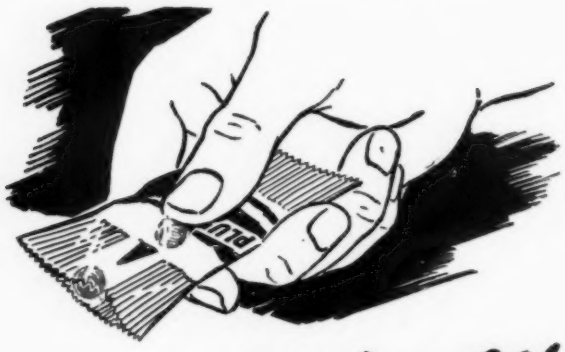

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